

MEMO

To: Wayne Davis – USACE Paul Zang – Fort Drum Copies: Andy Vitolins – PIKA MP JV

From: Stefan Bagnato – PIKA MP JV Derek Rosso – PIKA MP JV Todd Carignan

Date: 2 February 2016 Project No.: GP14DRUM.RCSC

Subject: IRP 1795 Construction Completion Report Addendum Activation of Air Sparging Systems at Area 1795

This memorandum documents the activation of the air sparge (AS) systems at Area 1795 following the review of monitoring data indicating that the application of AS would increase the aggressiveness of the remediation and aid in achieving closure in a shorter time period. Both AS blowers were activated on September 30, 2015 and air was injected into the saturated zone in select existing air sparge wells. In order to achieve adequate coverage with the air sparge technology, 12 additional air sparge wells were installed between November 4 and November 11. All 12 of the new wells were subsequently connected to the system and activated on December 17, 2015. A layout of the system indicating the wells which are currently operational is included as Figure 1.

Air Sparge Well Installation

In November 2015, 12 new AS wells (AS-1 through AS-12) were installed to supplement the existing AS well network. Air sparge wells AS-1 through AS-9 were installed to an approximate depth of 26 feet with a screen interval from 24 to 26 feet below grade. Air sparge wells AS-10 through AS-12 were installed to an approximate depth of 31 feet with a screen interval from 29 to 31 feet below grade. Each AS well was constructed with 2-inch diameter SCH 40 PVC with a two-foot length of 0.010-inch slot screen. Well sampling, construction, and development logs are provided in Appendix A.

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PIKA-MP JV



Process Piping and Wellhead Construction Upgrades

Upgrades were made to the above-grade piping network located in the system building and piping enclosure which houses portions of the piping manifolds and headers prior to running below grade. The existing AS process piping was inspected and tested. The existing Pitot tube devices were re-installed using SCH 80 PVC threaded saddle fittings. The AS manifold was connected to the existing below grade headers utilizing pressure rated hose.

Existing AS wells that were not used to connect to new AS wells were not modified. The new AS wells were connected to the existing AS headers utilizing nearby adjacent AS wells by installing galvanized threaded nipple/barb fittings to allow connection of a 1-inch diameter pressure rated hose, which was connected above grade between the existing AS well and the new AS well. The hose was installed within a 2-inch diameter PVC pipe sleeve for added protection. The new AS wells were connected using the hose installed to a steel tee fitting above grade with the riser transitioning to PVC approximately 2 feet below grade. Wellhead construction details for the bioventing and AS wells are presented on Figure 2.

System Operational Parameters

Each of the AS blowers were started slowly to allow for monitoring of the process equipment (e.g., blower belts, heat exchanger, piping, and gauges) for safe operation. The system operational parameters for Trailer A and Trailer B AS systems are included in Tables 1 and 2, respectively. A piping and instrumentation diagram for both AS system is included in Figure 3.

Enclosures:

Figures 1, 2, and 3 Tables 1 and 2 Appendix A – Well Logs



Figures





WELLHEAD DETAIL FOR BIOVENTING



- GALVANIZED STEEL PIPE

- EXISTING GRADE

- GALVANIZED STEEL COUPLING

NOT TO SCALE







teqd) LD:(Opt) PIC:(Opt) PM:(Redd) TM:(Opt) LYR:(Opt)ON=':OFF="REF" 0000000020PIDsVRP CCR/PID_Air Sparge for area 1795A - Existing dwg LAYOI

GRAPHIC SCALE



 $\langle 3 \rangle$ HIGH TEMPERATURE ALARM, SYSTEM SHUTDOWN

2 HIGH TEMPERATURE ALARM, SYSTEM SHUTDOWN



HIGH PRESSURE ALARM, SYSTEM SHUTDOWN

 \rightarrow as wells

 \rightarrow as wells



Tables

| Table 1 | | | | | | | | |
|---------------------------------------|--|--|--|--|--|--|--|--|
| Fort Drum IRP | | | | | | | | |
| 1795 Trailer A Air Sparge System Data | | | | | | | | |

| | | Operational | Blower | Heat Exchanger | Heat Exchanger | Heat Exchanger | Heat Exchanger | Differential | Pre-Inlet | Post-Filter | Bleed Air | |
|------------|-------------|-------------|----------|-------------------|-------------------|-------------------|-------------------|---------------|------------|-------------|-----------|-----------------------------|
| Date | Time | Upon | Runtime | Inlet | Inlet | Outlet | Outlet | Pressure (in. | Vacuum (in | Vacuum (in | Percent | Operational Comments |
| | | Arrival? | (hrs) | Temperature | Pressure (in. | Temperature | Pressure (in. | w.c) | w c) | w c) | Open (%) | |
| | | | | (F) | w.c.) | (F) | w.c.) | | w.c.y | w.c., | | |
| 9/30/2015 | NM | NO | NM | NM | NM | NM | NM | NM | NM | NM | NM | Air sparge system startup |
| 10/1/2015 | 8:34 AM | YES | 43,351.6 | 136 | 10 | 75 | 9 | NM | 4 | NM | 0 | |
| 10/2/2015 | 10:53 AM | YES | 43,351.6 | 142 | 9 | 82 | 9 | NM | 6 | NM | 0 | |
| 10/5/2015 | 11:49 AM | YES | 43,351.6 | 154 | 8 | 89 | 7.5 | NM | 10 | NM | 0 | |
| 10/6/2015 | 8:51 AM | YES | 43,351.6 | 151 | 8.5 | 86 | 8 | NM | 4 | NM | 0 | |
| 10/7/2015 | 9:44 AM | YES | 43,351.6 | 152 | 8 | 88 | 7.5 | NM | 5 | NM | 0 | |
| 10/8/2015 | 9:42 AM | YES | 43,351.6 | 143 | 9 | 80 | 8.5 | NM | 4 | NM | 0 | |
| 10/12/2015 | 8:39 AM | YES | 43,351.6 | 158 | 8 | 93 | 7.5 | NM | 2 | NM | 0 | |
| 10/13/2015 | 9:57 AM | YES | 43,351.6 | 153 | 8 | 88 | 7.5 | NM | 2 | NM | 0 | |
| 10/14/2015 | 1:51 PM | YES | 43,351.6 | 147 | 8 | 86 | 7.5 | NM | 2 | NM | 0 | |
| 10/15/2015 | 10:12 AM | YES | 43,351.6 | 149 | 8.5 | 88 | 7.5 | NM | 2 | NM | 0 | |
| 10/16/2015 | 9:02 AM | YES | 43,351.6 | 138 | 9 | 78 | 8.5 | NM | 2 | NM | 0 | |
| 10/19/2015 | 9:23 AM | YES | 43,351.6 | 123 | 10.5 | 66 | 9.25 | NM | 2 | NM | 0 | |
| 10/20/2015 | 12:13 PM | YES | 43,351.6 | 151 | 8 | 90 | 7.5 | NM | 2 | NM | 0 | |
| 10/21/2015 | 9:50 AM | YES | 43,351.6 | 137 | 9 | 76 | 8.5 | NM | 2 | NM | 0 | |
| 10/22/2015 | 9:37 AM | YES | 43,351.6 | 156 | 8 | 94 | 7.5 | NM | 2 | NM | 0 | |
| 10/23/2015 | 8:47 AM | YES | 43,351.6 | 127 | 10 | 70 | 9 | NM | 2 | NM | 0 | |
| 10/26/2015 | 10:48 AM | YES | 43,351.6 | 131 | 10 | 95 | 8.5 | NM | 2 | NM | 0 | |
| 10/27/2015 | 10:18 AM | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | NM | OFF | Cycling |
| 10/28/2015 | 12:32 PM | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | NM | OFF | Cycling |
| 10/29/2015 | 3:16 PM | YES | 43,351.6 | 161 | 10 | 86 | 9 | NM | 2 | NM | 0 | |
| 10/30/2015 | 10:41 AM | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | NM | OFF | Cycling |
| 11/2/2015 | 8:54 AM | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | NM | OFF | Cycling |
| 11/03/2015 | 9:53 A.M. | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 11/03/2015 | 9:53 A.M. | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 11/04/2015 | 9:16 A.M. | YES | 43,351.6 | 169 | 11.5 | 81 | 10.5 | NM | 2 | NM | 0 | |
| 11/05/2015 | 0.06 0 M | NO | 12 251 6 | OFF | 055 | OFF | 055 | 055 | OFF | OFF | OFF | Down for new well |
| 11/03/2013 | 9.00 A.IVI. | NO | 43,331.0 | OFF | OFF | UFF | OFF | OFF | UFF | OFF | OFF | installation. |
| 11/06/2015 | 8:31 A.M. | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Down for new well |
| | | | | | | | | | | | | Down for now well |
| 11/09/2015 | 10:46 A.M. | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | installation. |

| Table 1 |
|---------------------------------------|
| Fort Drum IRP |
| 1795 Trailer A Air Sparge System Data |

| Date | Time | Operational Upon Arrival? | Blower Runtime (hrs) | Heat Exchanger Inlet Temperature (F) | Heat Exchanger Inlet Pressure (in. w.c.) | Heat Exchanger Outlet Temperature (F) | Heat Exchanger Outlet Pressure (in. w.c.) | Differential Pressure (in. w.c) | Pre-Inlet Filter Vacuum (in. w.c.) | Post-Filter Inlet Vacuum (in. w.c.) | Bleed Air Percent Open (%) | Operational Comments |
|------------|------------|---------------------------------|----------------------------|--|--|---|---|---------------------------------------|---|--|----------------------------------|--|
| 11/10/2015 | 8:29 A.M. | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Down for new well installation. |
| 11/11/2015 | 9:48 A.M. | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Shut down for new well installation. |
| 11/12/2015 | 8:50 A.M. | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Down for new well installation. |
| 11/13/2015 | 9:50 A.M. | NO | 43,351.6 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 11/16/2015 | 10:42 A.M. | YES | 43,351.6 | 156 | 10 | 86 | 9 | NM | 2 | 2 | 0 | |
| 11/16/2015 | 11:39 A.M. | YES | 43,351.6 | 158 | 8.5 | 77 | 8.5 | 1 | 3 | 2 | 0 | |
| 11/17/2015 | 10:13 A.M. | YES | 43,352.2 | 145 | 11.5 | 73 | 10 | NM | 2 | 2 | 0 | |
| 11/18/2015 | 2:46 P.M. | YES | 43,352.2 | 162 | 10 | 88 | 9 | NM | 2 | 2 | 0 | |
| 11/19/2015 | 8:37 A.M. | NO | 43,352.2 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 11/20/2015 | 9:40 A.M. | YES | 43,352.2 | 160 | 11.5 | 80 | 10.5 | NM | 2 | 2 | 0 | |
| 11/23/2015 | 8:46 A.M. | NO | 43,352.2 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 11/30/2015 | 10:13 A.M. | YES | 43,352.2 | 136 | 11 | 69 | 10 | NM | 2 | NM | 0 | |
| 12/01/2015 | 9:18 A.M. | YES | 43,352.2 | 156 | 11.5 | 78 | 11 | NM | 2 | NM | 0 | Drained condensate from compressor. |
| 12/02/2015 | 9:14 A.M. | YES | 43,352.2 | 170 | 11 | 90 | 10 | NM | 2 | NM | 0 | |
| 12/03/2015 | 9:18 A.M. | YES | 43,352.2 | 161 | 12 | 83 | 11 | NM | 2 | NM | 0 | |
| 12/04/2015 | 8:29 A.M. | NO | 43,352.2 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 12/07/2015 | 11:21 A.M. | YES | 43,352.2 | 144 | 10 | 83 | 9 | NM | 2 | NM | 0 | |
| 12/08/2015 | 9:23 A.M. | YES | 43,352.2 | 157 | 12 | 80 | 11 | NM | 2 | NM | 0 | |
| 12/09/2015 | 8:59 A.M. | NO | 43,352.2 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 12/14/2015 | 10:43 A.M. | YES | 43,352.2 | 165 | 9.5 | 92 | 8.5 | NM | 2 | NM | 0 | |
| 12/15/2015 | 9:45 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Shut down for new AS well hookup. |
| 12/16/2015 | 9:05 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Shut down for new AS well hook ups. |
| 12/17/2015 | 11:39 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Was off for new AS hookups just turned it back on. |
| 12/18/2015 | 8:40 A.M. | NO | 43,352.2 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 12/21/2015 | 11:08 A.M. | YES | 43,352.2 | 150 | 10 | 84 | 9 | NM | 2 | 2 | 0 | |
| 12/28/2015 | 10:16 A.M. | YES | 43,352.2 | 125 | 12.5 | 62 | 11 | NM | 2 | 2 | 0 | |

| Table 1 | |
|---------------------------------------|---|
| Fort Drum IRP | |
| 1795 Trailer A Air Sparge System Data | ł |

| Date | Time | Operational Upon Arrival? | Blower Runtime (hrs) | Heat Exchanger Inlet Temperature (F) | Heat Exchanger Inlet Pressure (in. w.c.) | Heat Exchanger Outlet Temperature (F) | Heat Exchanger Outlet Pressure (in. w.c.) | Differential Pressure (in. w.c) | Pre-Inlet Filter Vacuum (in. w.c.) | Post-Filter Inlet Vacuum (in. w.c.) | Bleed Air Percent Open (%) | Operational Comments |
|------------|------------|---------------------------------|----------------------------|--|--|---|---|---------------------------------------|---|--|----------------------------------|----------------------|
| 12/29/2015 | 1:03 P.M. | YES | 43,352.2 | 127 | 14 | 65 | 13 | NM | 2 | 2 | 0 | |
| 12/30/2015 | 10:25 A.M. | YES | 43,352.2 | 105 | 15 | 58 | 13.5 | NM | 2 | 2 | 10 | |
| 01/04/2016 | 11:04 A.M. | YES | 43,352.2 | 92 | 16.5 | 31 | 15 | NM | 2 | 2 | 10 | |
| 01/05/2016 | 11:51 A.M. | NO | 43,352.2 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 01/06/2016 | 9:36 A.M. | YES | 43,352.2 | 133 | 12.5 | 60 | 11.5 | 0.6 | 2 | 2 | 0 | |
| 01/07/2016 | 9:03 A.M. | YES | 43,352.2 | 102 | 15 | 48 | 6 | 0.44 | 2 | 2 | 0 | |
| 01/08/2016 | 10:01 A.M. | YES | 43,352.2 | 135 | 11.5 | 71 | 10.5 | 0.54 | 2 | 2 | 0 | |
| 01/11/2016 | 10:50 A.M. | YES | 43,352.2 | 125 | 11.5 | 62 | 10 | 0.48 | 2 | 2 | 0 | |

| Table 2 |
|---------------------------------------|
| Fort Drum IRP |
| 1795 Trailer B Air Sparge System Data |

| Date | Time | Operational Upon Arrival? | Blower Runtime (hrs) | Heat Exchanger Inlet Temperature (F) | Heat Exchanger Inlet Pressure (in. w.c.) | Heat Exchanger Outlet Temperature (F) | Heat Exchanger Outlet Pressure (in. w.c.) | Differential Pressure (in. w.c) | Pre-Inlet Filter Vacuum (in. w.c.) | Post-Filter Inlet Vacuum (in. w.c.) | Bleed Air Percent Open (%) | Operational Comments |
|------------|------------|---------------------------------|----------------------------|--|--|---|---|---------------------------------------|---|--|----------------------------------|--------------------------------------|
| 9/30/2015 | NM | NM | NM | NM | NM | NM | NM | NM | NM | NM | NM | Air sparge system startup |
| 10/1/2015 | 8:34 AM | Y | 49,136.1 | 150 | 8.5 | 77 | 10 | NM | 2 | NM | 0 | |
| 10/2/2015 | 10:53 AM | Y | 49,162.2 | 151 | 7.5 | 82 | 9 | NM | 3 | NM | 0 | |
| 10/5/2015 | 11:49 AM | Y | 49,235.2 | 159 | 7.5 | 92 | 8 | NM | 2 | NM | 0 | |
| 10/6/2015 | 8:51 AM | Y | 49,256.1 | 155 | 7 | 86 | 8 | NM | 4 | NM | 0 | |
| 10/7/2015 | 9:44 AM | Y | 49,281.1 | 156 | 7 | 88 | 7.5 | 0.9 | 4 | NM | 0 | |
| 10/8/2015 | 9:42 AM | Y | 49,305.1 | 146 | 7 | 84 | 8.5 | 0.9 | 4 | NM | 0 | |
| 10/12/2015 | 8:39 AM | Y | 49,399.6 | 160 | 6.5 | 93 | 7.5 | 0.75 | 2 | NM | 0 | |
| 10/13/2015 | 9:57 AM | Y | 49,425.0 | 154 | 6 | 89 | 7.5 | 1 | 2 | NM | 0 | |
| 10/14/2015 | 1:51 PM | Y | 49,452.9 | 149 | 6.5 | 85 | 8 | 1 | 2 | NM | 0 | |
| 10/15/2015 | 10:12 AM | Y | 49,473.7 | 150 | 6.5 | 86 | 8 | 1 | 2 | NM | 0 | |
| 10/16/2015 | 9:02 AM | Y | 49,496.0 | 140 | 8.5 | 79 | 8.5 | 1 | 2 | NM | 0 | |
| 10/19/2015 | 9:27 AM | Y | 49,568.5 | 125 | 7.75 | 65 | 9 | 1 | 2 | NM | 0 | |
| 10/20/2015 | 12:13 PM | Y | 49,595.3 | 150 | 6.5 | 89 | 7.5 | 1 | NM | NM | 0 | |
| 10/21/2015 | 9:50 AM | Y | 49,616.9 | 138 | 7 | 78 | 8.5 | 1 | 2 | NM | 0 | |
| 10/22/2015 | 9:37 AM | Y | 49,640.8 | 155 | 6 | 93 | 7.5 | 1 | 2 | NM | 0 | |
| 10/23/2015 | 8:47 AM | Y | 49,363.9 | 127 | 7.5 | 70 | 9 | 1 | 2 | NM | 0 | |
| 10/26/2015 | 10:43 AM | Y | 49,738.2 | 131 | 7 | 74 | 8.5 | 1 | 2 | NM | 0 | |
| 10/27/2015 | 10:18 AM | N | 49,748.3 | OFF | OFF | OFF | OFF | OFF | OFF | NM | 0 | Off for cycling |
| 10/28/2015 | 12:32 PM | N | 49,757.3 | OFF | OFF | OFF | OFF | OFF | OFF | NM | 0 | cycling |
| 10/29/2015 | 3:16 PM | Y | 49,766.2 | 170 | 8.5 | 85 | 10 | 1 | 2 | NM | 0 | |
| 10/30/2015 | 10:41 AM | N | 49,772.3 | OFF | OFF | OFF | OFF | OFF | OFF | NM | 0 | cycling |
| 11/2/2015 | 8:54 AM | N | 49,796.3 | OFF | OFF | OFF | OFF | OFF | OFF | NM | 0 | cycling |
| 11/02/2015 | 8:54 A.M. | NO | 49,796.3 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 11/04/2015 | 9:16 A.M. | YES | 49,812.1 | 179 | 9 | 87 | 11 | 1 | 2 | NM | 0 | |
| 11/05/2015 | 9:06 A.M. | NO | 49,812.8 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Down for new well insallation. |
| 11/06/2015 | 8:31 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Down for new well insallation. |
| 11/09/2015 | 10:46 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Down for new well inslallation. |
| 11/10/2015 | 8:29 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Down for new well installation. |
| 11/11/2015 | 9:48 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Shut down for new well installation. |
| 11/12/2015 | 8:50 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Down for new well installation. |
| 11/13/2015 | 9:50 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 11/16/2015 | 10:46 A.M. | YES | 49,858.2 | 163 | 8 | 84 | 10 | 1 | 2 | 2 | 0 | |
| 11/17/2015 | 10:17 A.M. | YES | 49,872.7 | 148 | 9 | 72 | 10.5 | 1 | 2 | 2 | 0 | |
| 11/18/2015 | 2:50 P.M. | YES | NM | 166 | 8 | 86 | 9 | 1 | 2 | 2 | 0 | |
| 11/19/2015 | 8:38 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |

| Table 2 |
|---------------------------------------|
| Fort Drum IRP |
| 1795 Trailer B Air Sparge System Data |

| Date | Time | Operational Upon Arrival? | Blower Runtime (hrs) | Heat Exchanger Inlet Temperature (F) | Heat Exchanger Inlet Pressure (in. w.c.) | Heat Exchanger Outlet Temperature (F) | Heat Exchanger Outlet Pressure (in. w.c.) | Differential Pressure (in. w.c) | Pre-Inlet Filter Vacuum (in. w.c.) | Post-Filter Inlet Vacuum (in. w.c.) | Bleed Air Percent Open (%) | Operational Comments |
|------------|------------|---------------------------------|----------------------------|--|--|---|---|---------------------------------------|---|--|----------------------------------|---|
| 11/20/2015 | 9:45 A.M. | YES | 49,917.2 | 156 | 8.5 | 80 | 10 | 1 | 2 | 2 | 0 | |
| 11/23/2015 | 8:50 A.M. | YES | 49,961.2 | 119 | 9.5 | 63 | 10 | 1 | 2 | 2 | 0 | |
| 11/30/2015 | 10:23 A.M. | YES | 49,997.9 | 118 | 9 | 62 | 10 | 0.5 | 2 | NM | 0 | |
| 12/01/2015 | 9:25 A.M. | YES | 50,000.3 | 135 | 10 | 70 | 10.5 | 0.1 | 2 | NM | 0 | |
| 12/02/2015 | 9:41 A.M. | YES | NM | 131 | 10 | 72 | 11 | 1 | 2 | NM | 20 | Repaired break in air line and restarted system, and cracked open the bleed line on AS system due to press. relief valve being open. |
| 12/03/2015 | 9:21 A.M. | YES | 50,025.7 | 130 | 7 | 73 | 8.5 | 1 | 2 | NM | 0 | |
| 12/04/2015 | 8:30 A.M. | NO | 50,040.3 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 12/07/2015 | 11:27 A.M. | YES | 50,087.8 | 131 | 7 | 74 | 8 | 1 | 2 | NM | 0 | |
| 12/08/2015 | 9:28 A.M. | YES | 50,100.8 | 130 | 7.5 | 74 | 8.5 | 1 | 2 | NM | 0 | |
| 12/09/2015 | 9:01 A.M. | YES | 50,115.4 | 109 | 7 | 74 | 8 | 1 | 2 | NM | 0 | |
| 12/14/2015 | 10:49 A.M. | YES | 50,191.4 | 145 | 6.5 | 78 | 8 | 1 | 2 | NM | 0 | |
| 12/15/2015 | 9:45 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Shut down for new AS well hook up. |
| 12/16/2015 | 9:06 A.M. | NO | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Shut down for new AS well hook ups. |
| 12/17/2015 | 11:40 A.M. | NO | 50,192.0 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Off for new AS hookups just turned them back on. |
| 12/18/2015 | 8:40 A.M. | NO | 50,203.2 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 12/21/2015 | 11:13 A.M. | YES | 50,250.4 | 161 | 8.5 | 82 | 10 | 1 | 2 | 2 | 0 | |
| 12/28/2015 | 10:21 A.M. | YES | 50,354.6 | 133 | 9 | 72 | 10.5 | | 2 | 2 | 0 | |
| 12/29/2015 | 1:09 P.M. | YES | 50,370.8 | 134 | 8.5 | 75 | 9.5 | 1 | 2 | 2 | 0 | |
| 12/30/2015 | 10:32 A.M. | YES | 50,384.7 | 150 | 8.5 | 82 | 9.5 | 1 | 2 | 2 | 0 | |
| 01/04/2016 | 11:12 A.M. | YES | 50,460.4 | 109 | 10 | 52 | 11 | 1 | 2 | 2 | 0 | |
| 01/05/2016 | 11:52 A.M. | NO | 50,475.7 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Cycling. |
| 01/06/2016 | 9:41 A.M. | YES | 50,488.9 | 132 | 8.75 | 71 | 10.5 | 0.75 | 2 | 2 | 0 | |
| 01/07/2016 | 9:07 A.M. | YES | NM | 114 | 9 | 65 | 9.5 | 1 | 2 | 2 | 0 | |
| 01/08/2016 | 10:05 A.M. | YES | 50,519.3 | 138 | 8.5 | 73 | 10 | 1 | 2 | 2 | 0 | |
| 01/11/2016 | 10:48 A.M. | YES | 50,565.0 | 136 | 8.5 | 78 | 10 | 1 | 2 | 2 | 0 | |



Appendix A

Well Logs



| SAND PACE PACE DAS C-S' DAS Control of the second sec | Project 1795 AS Wells Well 1795-AS-01 Town/City Wocker-town (Fort prun) Output County Jefferson State NY Permit No. Land-Surface Elevation and Datum: |
|--|---|
| Well casing, 2 inch diameter, SCH 40 PVC Backfill Grout 5-21 94 | feet Surveyed Estimated Installation Date(s) Drilling Method <u>6119</u> HSA Drilling Contractor Drilling Fluid <u>Potable Water</u> |
| Bentonite slurry <u>23</u> ft* pellets Bachoyer Sand | Development Technique(s) and Date(s) Air lifting 11/12/15 |
| - 24_ft* -Well Screen. - 2 inch diameter - S(1 40 PVC , 10 slot - Gravel Pack | Fluid Loss During Drilling gallons Water Removed During Development ~ 34. 0gallons Static Depth to Water |
| Sand Pack Formation Collapse 2 ft* ft* Measuring Point is Top of Well Casing Unless Otherwise Noted. | Remarks <u>Final DTB: 27.00 FH BTOL</u> <u>HP Was with ~ 12 inches of PVC above grade</u> <u>Machae Visco</u> |

| | - | | | | | | | Page | of |] | | |
|--------------|----------|--|------------|---------------------|----------|-------------|----------|-----------------------|----------------|--|--------|--|
| Project/No. | Fort D | rum IRP | Pas 1 | 5 Wells | Well | 1795-15-01 | Date | 11/12/15 | | un tu an | | |
| Total Double | 12 00 | () 221 | Casing | (in choc) | 2 11 | | Purge I | Method | | | | |
| Total Depth | 11 91 | FL MOL | Diameter | (Inches) | 2.91 | - lless | | Submoroi | di | - | | |
| vvater Level | 11.14 | H DIOL | | me (gai) | 210 | gauins | | Submersi | | Spalar. | | |
| Water Colum | in 15.64 | 1+ | lotal Volu | Ime Purged | N34.0 | gallons | Davala | Other | air litti | Ban u. | (100 | |
| Pump On | 1505 | | | Pump Off | 1524 | | Develo | реа ву | leation hiver | CIET | inuges | |
| U | | Well Casin | g Volumes | 01 - 0.4 | c | 2" - 0 | 27 | 4" - 0 CE | 0 | | | |
| gallon/loot | | $1 - \frac{1}{2}$ = 0.08 $1 - \frac{1}{2}$ = 0.09 | | 2 - 0.1 2-½" = (| 0.26 | 3-1/2" = | 0.50 | 4 = 0.05 6" = 1.47 | | | | |
| | | | | | 1 | T | I | | | | | |
| Time | Minutes | Rate | DTW | Gallons | pH | Specific | Temp. | Turbidity | REMARK | s | | |
| | Elapsed | (gpm) | (π) | Purged | | (mS/om) | | (NTU) | (PID readings, | color, | | |
| 1.0.0 | 1.6 | | 10 07 | 15.7 | 7 17 | (1113/011) | | 21. 2 | | / | | |
| 1515 | 10 | 1153 | 19.00 | 1213 | 7155 | 3,3+ | 13.00 | 1 08 | | | | |
| 1520 | 15 | 2.21 | 14.04 | 26.35 | 7.56 | 3.61 | 12.8+ | 9.60 | | | | |
| 1525 | 20 | 1.36 | 14.04 | 33.15 | 7.43 | 3.56 | 12.75 | 2.70 | - | | | |
| More the | n 10 | wal vo | lune | cemared. | turbid | Jely less - | than. | 50 NTU | | | | |
| FINAL PTB: | 27.00 | Ft BTOC | | | | 0 | | | | | | |
| Final PTW. | 12.02 | FIBAC | | | | | | | | | | |
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| Boring/Well 1795-AS | ∽ó∖Project/N | 10. GP14P | RUM. RUSC. HI79 | <u>S</u> Pageof |
|-----------------------------|------------------------------|----------------------------|-------------------------|---|
| Site | | | Drilling | g Drilling |
| Location Fort | Prum, NY | | Starte | d 11/11/15 Completed 11/11/15 |
| Total Depth Drilled | _2. Feet | Hole Diamete | r <u> </u> | Type of Sample/ Coring Device 2^{11} SS \times 2 |
| Length and Diameter | | | | |
| of Coring Device | | | | Sampling Interval 20 - 24 feet |
| Land-Surface Elev. | feet | | Surveyed Estima | ated Datum |
| Drilling Fluid Used | Potable wi | der | | Drilling Method (6 174) HSA |
| Drilling Contractor Noth | nagle | | | Driller Kevin Helper Kyle Kyan |
| Prepared | 0 | | | Hammer Hammer |
| By Mean | an Kiser | | | Weight 40 Drop 36 ins. |
| Sample/Core Depth | | Time/Hydraulic | | |
| (feet below land surface) | Core PID Recovery Reading | Pressure or Blows per 6 | | |
| From To | (feet) (ppm) | Inches | Sample/Core Description | |
| 0.0 5.0 | MA AN | NA | hand deared 0.0 - | to 5.0 Ft |
| R P | | | | |
| LL | | | | |
| TI | | | | |
| NL | | | | |
| DL | | | | |
| 20.0 22.0 | 2,5 0.4 10 | 10-21-33-49 | brown fine to medin | tow know me |
| | 0,9 e | | (slight adapt) | |
| | 0.2 21 | | | |
| | 0.4 2 | , | | |
| 22 0 24 0 | | - K-12-39 39 | branna fin to made | son sold wat [22 a - 22 1 to sca) |
| | 0.2.22 | - | FILL A AND | |
| | 6.2.22 | - | Sught and Sub cond | [2] 1 23 1 - P(x) |
| | 6 425 | | Pi the she | J NEX, DENE CELLS CO. 6 MINUS |
| 240 260 | 17 0.2 2 | 2-16-12-51 | en low Fin- | and wat Twith black staining |
| 21.0 2010 | 0.2 | | array browshi, the | T NOT WITH MOLES WITH |
| | 01, 24. C | | (dill adar) | |
| | 6 4 1/ | é | L'Stally Court | |
| | 25, | | | |
| EOB @ 24.0 FT | bins | | SCREENED AT 24.0 | TO 24.0 FT BUS |



(Unconsolidated) 1795 AS Wells Well 1795-AS-02 Project 个ft LAND SURFACE \$ 12 IACAS SAND Watertown (Fort Drum PACE Town/City 6.51 Jeffenson State NY County Bas inch diameter Permit No. drilled hole Land-Surface Elevation and Datum: Surveyed feet - Well casing, Estimated 2 inch diameter, Installation Date(s) SCH 40 PVC 6119 11 HSA **Drilling Method** Backfill Grout 5-21 84 Dri Ilina **Drilling Contractor Drilling Fluid** 21 ft* Development Technique(s) and Date(s) Bentonite slurry Air lifting 11/12/15 23 ft* pellets 8 choker sand Fluid Loss During Drilling gallons ~ 39.0 24 Water Removed During Development gallons ft* 11.23 Static Depth to Water feet below M.P. feet below MP Stavic dopth to bottom 27.00 Pumping Depth to Water feet below M.P. Well Screen. 12.71 2 inch diameter 16 hours minuts **Pumping Duration** SCH 40 PVC . 10 slot Yield gpm Date Specific Capacity gpm/ft Gravel Pack Well Purpose Air sparge Sand Pack Formation Collapse Final DTB: 27.00 A BTOC Remarks 26 ft* ft* Measuring Point is MP was with ~ 12 inches of PVC above grade Top of Well Casing Unless Otherwise Noted. Meghon Kiser * Depth Below Land Surface Prepared by

Drilling Forms.xlsx.xls Well Constr

| WORILOFI | ig vve | II Deve | lopinei | III LOY | | | | Page | of | |
|---|---|----------------------------|--------------------|-----------------------|--------|------------------------|----------------------|----------------------|--------------------------------------|-----------|
| Project/No. | Fort DI | rum Ir | LP 1795 | AS weils | Well | 1795-15-02 | Date | 11/12/15 | | |
| Total Depth | 27.00 | ST BUDG | Casing Diameter | (inches) | 2" | | Purge I | Vlethod Centrifug | al | |
| Water Level | 11.23 | ET BTEL | Well Volu | ıme (gal) | 2.52 | gallers | | Submers | ible | |
| Water Colum | n 15.7- | 111 | Total Vol | ume Purged | ~ 39.6 | gallons | $\boldsymbol{\zeta}$ | Other | air lifting | |
| Pump On | 1445 | | - | Pump Off | 1561 | 0 | Develo | ped By | Kevin Buich (N Highen hour CARUS | ethnagle) |
| | | Well Casin | ig Volumes | ∩ " − 0 1 | 6 | 3" = 0 | 37 | 4" = 0.65 | 0 | |
| gallon/foot | | $1 - \frac{1}{2}'' = 0.00$ |) | 2 - 0.1 2-1⁄2" = (| 0.26 | 3-1/2" = | 0.50 | 6" = 1.47 | | |
| Time | Minutes | Rate | DTW | Gallons | pН | Specific | Temp. | Turbidity | REMARKS | |
| | Elapsed | (gpm) (mL/min) | (ft) | Purged | | Conductance (mS/cm) | (C) (F) | (NTU) | (PID readings, color, odor, etc.) | |
| 1450 | 5 | 2.54 | 12.71 | 12.7 | 7.81 | 3.49 | 13.88 | 12.8 | - / | |
| 1455 | 16 | 2.54 | 12.73 | 25.4 | 7.71 | 3.13 | 13.84 | 12.1 | _ | |
| 1500 | 15 | 2.54 | 12.69 | 38.1 | 7.44 | 3.02 | 13.71 | 11.4 | | |
| More the | n 10 i | Nal VIS | umes i | emoved, | turbi | liby less | Than | 56 | NTU | |
| Final DTB | 27.00 | FH BTU | | | | 0 | | | | |
| FinalDTW | 11.29 | A BOOL | | | | | | | | |
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| non-proceeding and the second s | the second se | | | | | | | | | |



| Boring/Well 1795 | - A5-02 | Project/No | GPH DE | UM. RUSC. HI | 795 | Page of |
|--|--------------------|----------------|--|----------------------|-------------------------|--|
| Site Location For-4 | PRUM, NY | | й ос | | Drilling Started 11/ | Drilling |
| | - 1920 - 1920 | | | | | Type of Sample/ |
| Total Depth Drilled | 26 | Feet | Hole Diameter | | inches | Coring Device 2^{n} 55 x 2 |
| Length and Diameter of Coring Device | | | | | | Sampling Interval 26 - 21 feet |
| Land-Surface Elev. | | feet | | Surveyed | Estimated | Datum |
| Drilling Fluid Used | Potabl | e Witte | r | | | Drilling Method |
| Drilling Contractor <u>No</u> | thrage | | | | | Driller Kyle Ryan |
| Prepared By <u>Me</u> | ghan Kix | er | | | | Hammer Hammer Weight <u>\40</u> Drop <u>30</u> ins. |
| (Sample/Core Depth (feet below land surface |) Core Recovery | PID Reading | Time/Hydraulic Pressure or Blows per 6 | | | |
| From To | (feet) | (ppm) | Inches | Sample/Core Descript | lion | - 1 |
| 0.0 5.1 | D NA | NM | NA | hand cleare | 0.0 6 | to 5.0 Ft |
| BD | | | | | | |
| LR | | | | | | |
| II | | - | | | | |
| NL | | | | | | |
| PL | | B | | | | |
| 20:0 22 | .0 1.7 | 0.020.0 | 2-10-24-27 | aray-brown, | fine to | medium sond, wet |
| | | 0.020.5 | | (no odor) | | |
| | | 0.021.0 | | | | |
| | | 0.021.5 | | | 14) | |
| 22.0 24 | .0 2.0 | 0.0 22.0 | 16-37-56-44 | SAA | | |
| | | 0.0 22.5 | | | | |
| | | 0.0 23.0 | | | | |
| | | 0.0 23.5 | | | | |
| 24.0 26. | 0 1.7 | 0.6 2.4.0 | 13-34-43-51 | SAA | | |
| | | 0.0 24.5 | | | | |
| | | 0.025.6 | | | | |
| | | 0.0 25.5 | | | | |
| | | | | | | |
| TEOB @ 24.0 | FT 1665 | | | SCREENED C | 24.0 78 | 26.6 FT 13(15 |



| 6.6.00 | c [| 一不作 China | Project 1795 AS Wells Well 1795-AS-03 |
|--------|------------------------|--|--|
| PACE | | V LAND SURFACE | Town/City Wocker-town (Fort prum) |
| 0.51 | CN | 1 | County Jefferson State NY |
| Das | И | inch diameter | Permit No. |
| | И | drilled hole | Land-Surface Elevation and Datum: |
| | И | K | |
| | И | Well casing | |
| | И | 2 inch diameter. | Installation Date(s) |
| | И | SCH 40 PVC | Delling Mathed |
| | | Backfill | |
| | 1 | X Grout 5-21 74 | Drilling Contractor Nothnaale Drilling |
| | И | | Drilling Fluid Patall Intater |
| | И | | |
| | 4 | ∠ _ ∠) ft* | |
| | | | Development Technique(s) and Date(s) |
| | | | Air lifting 11/12/15 |
| | | ft*pellets | 8 |
| | | Acholer | |
| | | SUNO | |
| | | | Fluid Loss During Drillinggallons |
| | | <u>24</u> ft* | Water Removed During Development 🖌 2 <u>5.00</u> gallons |
| | | | Static Depth to Water 12.43 feet below M.P. |
| | | Well Screen. | Pumping Depth to Water |
| | | 2 inch diameter | Rumping Duration |
| | | SIGH 40 PTC, 10 SIGT | |
| | | | Yieldgpm Date |
| | | | Specific Capacitygpm/ft |
| | | | Well Purpose Aic sparge- |
| | | Sand Pack | |
| | | Formation Collapse | |
| | | | Romarka Thank 127 AU EL DAN |
| | | 2 #* | remains Pillio VIB1.00 PILLO |
| | | | |
| | | | |
| | | Measuring Point is Top of Well Casing | MP was with ~ 12.1 incher of PUC above marks |
| | | Unless Otherwise Noted. | |
| | | * Depth Below Land Surface | Prepared by Meanon Kiser |
| | Drilling F Well Cor | orms.xlsx.xls Istr | U |

| | | | | | | | | Page | of |
|-------------|----------|--|------------|-----------------------|-----------|-------------------|------------|--|---|
| Project/No. | FOFT DN | IN TRP | PASAY | Jew | Well 17 | 95-25-03 | Date | 11/12/19 | 5 |
| | | | Casing | | 2 11 | | Purge N | Nethod | - 1 |
| Total Depth | 27.00 P | BTBC | Diameter | (inches) | 2 | | | Centrituga | al |
| Water Level | 12.43.Ft | BTOC | Well Volu | me (gal) | 2.33 ga | ulons | | Submersi | ble |
| Water Colum | in 14.57 | +2+ | Total Volu | ime Purged # | 25.00 | gallors | (| Other | air lifting |
| Pump On | 1530 | 1 | | Pump Off | 1346 | | Develo | ped By | Kevin Busch (102hhagle Heahan Kuer (ArcApas) |
| | | Well Casin | g Volumes | | | | | | 0 |
| gallon/foot | | $1 - \frac{1}{4}" = 0.06$ $1 - \frac{1}{2}" = 0.09$ | 5) | 2" = 0.10 2-½" = 0 | 6).26 | 3" = 0. 3-½" = | 37 0.50 | 4" = 0.65 6" = 1.47 | |
| | | | | | | | | | |
| Time | Minutes | Rate | DTW | Gallons | рН | Specific | Temp. | Turbidity | REMARKS |
| | Elapsed | (gpm) | (ft) | Purged | | Conductance | (0) | (NTU) | (PID readings, color, |
| | | (mL/min) | | | | (mS/cm) | (F) | | odor, etc.) |
| 1535 | 5 | 1.62 | 12.61 | 8.10 | 7.69 | 3.39 | 12.40 | 45.0 | |
| 1540 | 10 | 1.58 | 12.71 | 16.00 | 7.18 | 3.56 | 12.90 | 12.4 | 41.7800500000 |
| 1545 | 15 | 1.61 | 12.69 | 24.05 | 7.64 | 3.61 | 12.76 | 6.41 | |
| More than | 10 was | volumo | removed, | turbidity 6 | s han so | NTU | | | |
| FINAL PTR: | 27.10 | A BIGC | , | 0 | | | | | |
| Einel PTU | 44 51 | A BOLD | | | | | | | |
| FINA PIN | 16.1 | 1.160 | | | | | | | |
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| 9 | ARCADIS |
|--------|------------|
| Sample | e/Core Log |

| Boring/Well | 5-63 Project/No | GPHADRUM, RCSC | .HIZAS Page of | _ |
|--|------------------|-------------------------------|---|----|
| Site | | | Drilling Drilling | |
| Location Fort | Drum, NY | | Started 11/11/15 Completed 11/11/15 | - |
| Total Depth Drilled | Feet | Hole Diameter | Type of Sample/ inches Coring Device 2^{11} 55×2^{11} | - |
| Length and Diameter of Coring Device | | | Sampling Interval 20 - 26 fe | et |
| Land-Surface Elev. | feet | Surveyed | Estimated Datum | _ |
| Drilling Fluid Used | Potable wat | • (| Drilling Method 6 ^{1/2}) "H5. | A |
| Drilling Contractor North | nale | | Driller Kevin Helper Kyle Kylen | _ |
| Prepared By Meah | O hiser | | Hammer Hammer Weight 140 Drop <u>30</u> in: | s. |
| Sample/Core Depth (feet below land surface) | Core PID | Time/Hydraulic Pressure or | | |
| From To | Recovery Reading | Blows per 6 | escription | |
| | NIA NM | NA hand cha | ind and to so st | |
| R D | | nona esta | | |
| | | | | |
| TT | | | | |
| NL | | | | _ |
| PL | | | | |
| 20:0 22.0 | 1.6 0.6 20.0 | 5-22-48-47 Gray-brown | , fine to medium sand, wet E with black | |
| | 1.120.5 | Staining | @ 20,0 TO 20,8 FT Bas] | |
| | 0,9210 | (slight o | dor) | |
| | @. 1.2 21.5 | 0 | | |
| 22.0 24.0 | 1,5 1,4 22.0 | 9-21-418-50 aray - brown | , fine to medium sand, wet | |
| | 1.4 22.5 | Eshabet o | dor) | |
| | 1.1 23.0 | 0 | | |
| | 1.10 23,5 | | | |
| 24.0 26.0 | 1,8 1.1 24.0 | 12-29-40-49 SAA | | |
| | 1.5 24.5 | | | |
| | 0.725.0 | | | |
| | 0.16 25.5 | | | |
| | | | | |
| EOB@ 24.0 | Ft Das | SCHEENER | AT 24.0 TO 26.0 FT DW | |



| SAND (PACE) | And SURFACE 3 12 in dws | Project 1795 AS Wells Well 1795-AS-04 Town/City Water-town (Fort prum) |
|---------------------|---|--|
| 0-5' C Bas | drilled hole | County <u>Jefferson</u> State <u>NY</u> Permit No. |
| | | Land-Surface Elevation and Datum: |
| | 2 inch diameter, SCH 40 PVC | Installation Date(s) |
| | Backfill Grout <u>5-21 F4</u> | Drilling Contractor Nothnagle Prilling |
| | ft* | |
| | Bentonite slurry <u>23</u> ft* pellets | Development Technique(s) and Date(s) Air lifting 11/12/15 |
| | sand | Fluid Loss During Drillinggallons |
| | ₩ell Screen. | Water Removed During Development 50.0 gallons Static Depth to Water 11.98 feet below M.P. Static Apply to Water 20.90 Feet below M.P. Pumping Depth to Water 14.24 feet below M.P. |
| | 2 inch diameter <u>S(A 40 PVC</u> , <u>10</u> slot | Pumping Duration <u>31</u> hourse minutes |
| | Gravel Pack | Specific Capacitygpm/ft Well Purpose |
| | Formation Collapse | Remarks Final DTB: 27.00 FH BTDC |
| | Measuring Point is Top of Well Casing Unless Otherwise Noted. | MP was with ~ 12 inches of PUC above grade |
| Drilling Well Co | * Depth Below Land Surface Forms.xlsx.xls | Prepared by Meahon Kiser |

| Monton | ig 110 | DOVO | iopinoi | n Log | | | | Page | of | |
|---|----------|-----------------------------------|------------|------------|----------|-------------|---------|-------------|----------------------|-----|
| Project/No. | Fort Dri | IN IRI | 1 PPUS A | Wells | Well | 795-A5-04 | Date | 11/12/1 | 5 | |
| | | | Casing | | - · · · | | Purge I | Viethod | | |
| Total Depth | 2690 9 | BACC | Diameter | (inches) | | | | Centrifugal | | |
| Water Level | 11.98 | 4 Broc | Well Volu | me (gal) | 2,39 0 | fallon | | Submersi | ble | |
| Water Colun | n 14.92 | -4- | Total Volu | ime Purged | ~ SO.0 - | gailon | 2 | Other | airutting | . ` |
| Pump On | 1500 | | | Pump Off | [43] | | Develo | реа ву | Nevin Burch (nothing | (ی |
| gallon/foot | | Well Casin $1-\frac{1}{4}$ = 0.06 | g Volumes | 2" = 0.1 | 6 | 3" = 0 | .37 | 4" = 0.65 | | |
| ganonnoor | | 1-1/2" = 0.09 |) | 2-1/2" = (| 0.26 | 3-1/2" = | 0.50 | 6" = 1.47 | | |
| Time | Minutes | Rate | DTW | Gallons | На | Specific | Temp. | Turbidity | REMARKS | |
| | Elapsed | (gpm) | (ft) | Purged | | Conductance | | (NTU) | (PID readings color | |
| | | (mL/min) | | | | (mS/cm) | (F) | | odor, etc.) | |
| 1410 | 16 | 1.53 | 14.24 | 15.3 | 7.67 | 4.01 | 12.55 | 26.3 | Official Contraction | |
| 1420 | 20 | 1.51 | 14.27 | 30.4 | 7.68 | 3.69 | 12.84 | 16.2 | | |
| 1430 | 30 | 1.89 | 14.25 | 49.3 | 7.68 | 3.78 | 12.83 | 4.42 | | |
| Hore the | n 10 y | vell vol | une r | emoved, | turbidi | by bs the | n 50 | NTU | | |
| FinalDTB | 27.00 | FT BTOL | | | | 0 | | | | |
| Final MTH | 11.98 | A BOOL | | د | | | | | | |
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ARCADIS Sample/Core Log

| Boring/Well | 1795-AS- | -04 | Project/No | GPIY PR | WH. RCSL . HT | 795 | | Page | - | of |) |
|---------------------------------------|-----------------|------------------|----------------|--|------------------|---------------------|------------------|------------------------------------|--------|----------|-------------|
| Site Location | Fort Dr | um, N | Y | | | Drilling Started | 10/15 | Drilling Completed | 11/10/ | (15 | |
| Total Depth Dr | illed | 26 | Feet | Hole Diamete | r \D | inches | Type o Corina | f Sample/ Device 2 ^ຳ | 55 | × 21 | |
| Length and Dia of Coring Devic | ameter | | | | | | 5 | Sampling Inter | val | 20-26 | feet |
| Land-Surface E | Elev. | | feet | | Surveyed | Estimated | – Datum | | • | | |
| Drilling Fluid U | sed | Potabl | e water | (| | | _ | Drilling Method | 1 | 619" | IBA |
| Drilling Contractor | Nothn | agle | - | | | | Driller | Kovin Busch Helper | | Kyle Ky | an |
| Prepared By | Neghan | Kis | i.r | | | | Hamm Weigh | er <u>140</u> Hamm | ier | 30 | ins. |
| Sample/Core Dep (feet below land s | oth surface) | Core Recovery | PID Reading | Time/Hydraulic Pressure or Blows per 6 Inches | Sample/Core Desc | stintion | | | | | |
| 0.D | 5.0 | NA | NM | NA | hand charge | DOD TR | 50 | FT BINS | | | |
| R D | 2.0 | | | | TIGTO CLEAT | | 20 | | | | |
| LR | | | | | | | | | | | |
| TI | | | | | | | | | | | |
| NL | | | | | | | | | | | |
| DL | | | | | | | | | | | |
| 20.0 | 22.0 | 1.8 | 0.020.0 | 29-36-51-54 | trace gravel | gray-brow | Nif. nu | e to medium | sard, | wet ti | 10.0-20.3 F |
| | | | 0.020.5 C | | (no odor) | | | grafi | | | |
| | | | 0.021.0 @ | | gray-brown, | time sard, W | ist | 1 20.3-10 | 21. | 8 PT BUS | 5 |
| 22.0 | 24.0 | 2.0 | 0.021.5 | 16-31-51-50 | Gray-brown | , fine sand | , wet | i, dense | | | |
| | | | 0.022.5 | | (mo adax) | , | , | | | | |
| | | | 0.023.0 | | | | | | | | |
| | ¥. | | 0.022.5 | | | | | | | | |
| 24.0 | 26.0 | 1.9 | 0.024.0 | 15-37-44-52 | SAA | | | | | | |
| | | | 0.0 24.5 | | | | | | | | |
| | | | 0.025.0 | | | | | | | | |
| | | | 0.0 25.5 | | | | | | | | |
| EOB@ | 26.0FT | Bas | | | SCREENED (| 24.0 TC | 26. | O FT BGS | | | |
| | | | | | | | | | | | |

Well Construction Log

| (en | | | 2 | - | 1706 A | A Malle | | ac Ma | ۸< |
|--------|------------------------|-----------------|----------------------|-------------------|--------------------|--|--|--|-------|
| SAND (| | AND SURFACI | E S 12 in chos | Project | Into A | O IVEIIS | - vven | 12-40- | 05 |
| 6.51 (| | | | County | Jescental | DVVII CIDI | State | NY | |
| Bas | MA | 16 | inch diameter | Permit No. | 00140130 | | | <u> </u> | |
| | drīī | led hole | | Land-Surface E | levation and Da | tum: | | | |
| | NK | | | | | feet | | ed | |
| | μ _ν | Well casing | g, | | | | Estimate | ed | |
| | ИИ | 2 | inch diameter, | Installation Date | e(s) | | | | |
| | | CH 40 | PVC | Drilling Method | 6 | 119 " HS/ | 4 | | |
| | | ckfill | | 1 | and a state of the | | | | |
| | Gro | out <u>5</u> | -21 84 | Drilling Contract | tor <u>N</u> | Shnagle | - Pri Ili | ng | |
| | | | | Drilling Fluid | Pot | table No | ter | 0 | |
| | 2 2 | ft* | | | | | | | |
| | | | _ | Development Te | echnique(s) and | Date(s) | | | |
| | Bento | nite | slurry | Air liftin | a 11/12/ | 115 | | | |
| | 2 | ∮ft* | pellets | | 0 | | | | |
| | | | Bchoker | | | | n-144644 - 25 m - 19 m - 19 m - 19 m | | |
| | | | sana | | | | | | |
| | | | | Fluid Loss Durin | ig Drilling | | ga | lions | |
| | | ft* | | Water Removed | I During Develop | pment ៷ 🔳 · | gaga | llons | |
| | | | | Static Depth to | Water | 10.43 | feet belo | w M.P. | |
| | V-We | II Screen. | inch diamator | Pumping Depth | to Water | 12.68 | feet belo | w M.P. | |
| | SCI SCI | A 40 PVC | , <u>10</u> slot | Pumping Duration | on <u>3</u> | hours | minutes | • | |
| | | | | Yield | | _gpm | Date | | |
| | | | | Specific Capacit | у | gpm/fl | | | |
| | | Fravel Pac | k | Well Purpose | Air | Sparae- | | | |
| | | and Pack | | | En | - page - | | and the france of production of the second | |
| | | ormation (| Collapse | | | an a | | | |
| | | | | Bemerke | Einal O | Hh: 77 | AN EL | bral | |
| | | f1 * | | Remarks | FILLUP | 10. 61. | 00 .1 | DIOC | |
| | | '` ft* | | | | | | | |
| | | | | | | | مروعی کا کار باشته باشته باشی می و بر پر با این می و این مروح این می و این می | | |
| | Measu Top of | Well Casi | is ing a Natad | MP was | with ~! | 12 inchos | of PV | c above | grade |
| | | th Below I | and Surface | Prepared by | Meahan | Kiter | | | 0 |
| C | rilling Forms.xlsx.xls | ECIOTI E | | | | | in na sang tang pang kanalakan kanalakan kanalakan kanalakan kanalakan kanalakan kanalakan kanalakan kanalakan | | |
| v | eil Constr | | | | | | | | |

| | .9 | | | | | | | Page |] of | 1 |
|-------------|---------|--------------------------|------------|------------|--------|--|---|-----------|--|--------------------------------|
| Project/No. | FOR Pr | UM IR | P 1795 | AS Weeks | Well | 795-AJ-05 | Date | 11/12 | /15 | |
| Tatal Dauth | | 17 10 | Casing | (inches) | 2 " | | Purge N | /lethod | al | |
| | 21. | BTOL | Moll Volu | (inches) | 2.1.4 | a autor | | Submersi | ble | |
| Water Level | 10.43 | the BTOL | Total Volu | me Durged | ~ 31 N | gallon | (| Other | | |
| Pump On |)260 | | Total Volu | Pump Off | 1231 | gaurons | Develop | bed By | Ruin Buch | (nothroad) |
| p | 1600 | | | | | | , Sectore and the first of the sector of the | | Highan never | |
| gallon/foot | | $1 - \frac{1}{4}$ = 0.06 | g volumes | 2" = 0.16 | 5 | 3" = 0. | 37 | 4" = 0.65 | 0 (4) | (22922) |
| | | 1-1⁄2" = 0.09 | | 2-1⁄2" = 0 | .26 | 3-1/2" = | 0.50 | 6" = 1.47 | | agentacipatical and the second |
| Time | Minutes | Rate | DTW | Gallons | рН | Specific | Temp. | Turbidity | REMARKS | |
| | Elapsed | (gpm) | (ft) | Purged | | Conductance | | (NTU) | (PID readings, co | olor, |
| | | (mL/min) | | | | (mS/cm) | (F) | | odor, etc.) | |
| 1210 | 10 | 1.02 | 12.68 | 10.2 | 7.15 | 3.39 | 1).41 | 21.1 | | |
| 1220 | 20 | 1.02 | 12.65 | 20.4 | 7.62 | 3.32 | 11.63 | 9.19 | "Manadalaya | |
| 1236 | 36 | 1.02 | 12.62 | 30.6 | 7.18 | 3.31 | 11.57 | 6.24 | ويتكلون | |
| More The | 01 M | wal | diene | premove | 1 turb | dely les | -than | 50 NTI | 1 | |
| FINAL PTB: | 27.00 | FH BT | Χ | | | 0 | | | | |
| FINAL PTW. | 10.42 | Ft BTO | <u>C</u> | | | | | | | |
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| Boring/Well | 1-795- AS- | -65 | Project/No | 69141 | DRUH. RCSC. 1 | 11795 | Pageof |
|------------------------|------------|--------------------|------------------|-----------------------|-----------------------|------------|---|
| Site | | | - | | | Drilling | Drilling |
| Location | Fort Ph | rw NA | | | · · · · | Started 11 | 6/15 Completed 11/16/15 |
| Total Depth D | Drilled | 26 | Feet | Hole Diamete | r 16 | inches | Type of Sample/ Coring Device 2^{11} 55×2^{1} |
| Length and D | iameter | | | | | | |
| of Coring Dev | /ICE | - | | | l | | Sampling Interval |
| Land-Surface | Elev. | 0 | -feet | | Surveyed | Estimated | Datum |
| Drilling Fluid | Used | Petable | - Water | | | | Drilling Method 6 9 H)A |
| Drilling Contractor | Nothr | aale | | | | | Driller Kivin Helper Kive Kyon |
| Prepared By | Meah | an Ki | Ser | | × | _ | Hammer Weight 140 Drop 30 ins. |
| Sample/Core D | epth | | | Time/Hvdraulic | | | |
| (feet below land | l surface) | Core | PID | Pressure or | | | |
| From | То | Recovery (feet) | Reading (ppm) | Blows per 6 Inches | Sample/Core Descripti | ion | |
| 0.0 | 5.0 | NA | NM | NA | hand cleared | 0.0 tr | 5.0 F4 |
| B D | | | | | | | |
| LR | | | | | | | |
| II | | | | | | | 1 |
| NL | | | | | | | |
| DL | | | | | | | |
| 20.0 | 22.6 | 2.0 | 0.0 20.0 | 6-25-37-50 | arau. fing th | medium | sand, wet, dens [20.0 to 20.7 FF] |
| | | | 0.0 20,5 | | (DA ODAL) | | |
| | | | 0.0 21.6 | | brown Fine s | and we | t, dens E0.7 to 22.0 FJ] |
| | | | 0.02115 | | (no oder) | | |
| 22.0 | 24.0 | 1.4 | Q. N. 22.0 | 16-29-50-56 | arou - brown. | file sand | 1. Wet dons. |
| | | | 6.0 22.5 | | Produci | | |
| | | - a- | 0.023.0 | | | | |
| | | | 0.0245 | | | | |
| 24.0 | 26.0 | 1.8 | @ 6 A 24.0 | 16-39-50-50 | SAA | | |
| | | | @ 245 | 10-51-50-50 | | | |
| | | | @ 25.D | | | | |
| | | | @ 25.5 | | | | |
| | | | | | | | |
| EOB@ | 26.0 1 | B65 | | | SCREENED C | 24.0 1 | 0 24.0 Ft 1865 |

Well Construction Log

| SAND PACL O-S' DGS Construction Constr | Project IPOS AS Wells Well IPOS-AS - OV Town/City Wocker-town (Fort prum) Output County Jefferson State NY Permit No. |
|---|---|
| Well casing, 2 inch diameter, SCH 40 PVC Backfill Grout 5-21 F4 | Installation Date(s) Drilling Method Drilling Contractor Drilling Fluid |
| Bentonite slurry <u>23</u> ft* pellets A Choyer Sand | Development Technique(s) and Date(s) Air Uifling 11/12/15 |
| <u>2</u> Well Screen. <u>2</u> inch diameter <u>5(x) 90 PVC</u> , <u>10</u> slot Gravel Pack | Fluid Loss During Drilling gallons Water Removed During Development ~ 28.6 gallons Static Depth to Water 14.51 feet below M.P. Static Aepth 4 bottom 27.60 Sock below M.P. Pumping Depth to Water 13.63 feet below M.P. Pumping Duration 21 hours Nincts Yield gpm Date Specific Capacity gpm/ft |
| Sand Pack Formation Collapse 2 ft* ft* Measuring Point is Top of Well Casing Unless Otherwise Noted. * Depth Below Land Surface | Remarks <u>Final PTB: 27.00 ft pTBC</u> <u>HP Was With ~ 12 inches of PVC above grade</u> Prepared by <u>Meghan Kiser</u> |

| | ig vici | 0010 | opinioi | n Log | | | | Page | of | |
|-------------|--|--|------------|-------------------------|-----------|------------------|---------|-----------------------|------------------------|-----------------|
| Project/No. | FOIG Dr | umIL | 1795 | 15 Wells | Well | 795-45-06 | Date | 11/12/1 | 5 | |
| | | | Casing | | · · · · · | | Purge N | Viethod | | |
| Total Depth | 27.0 | A BTOC | Diameter | (inches) | 2 " | | | Centrifug | al | |
| Water Level | 14,51 | H BTOC | Well Volu | me (gal) | 1.99 | gallons | | Submers | ible | |
| Water Colum | in 12.4 | 9 54 | Total Volu | ume Purged | ~ 28.0 | gailons | C | Other | airlifting | Υ. |
| Pump On | Pump On 1120 Pump Off 1141 Developed By Kevin Busch (noth negle) | | | | | | | | | |
| | | Well Casin | g Volumes | | _ | 011 - 0 | 07 | 41 - 0.CE | (ARIADS | s) [°] |
| gallon/foot | | $1 - \frac{1}{4} = 0.06$ $1 - \frac{1}{2} = 0.09$ | | 2" = 0.10 2-1⁄2" = 0 |).26 | 3 = 0. 3-½" = | 0.50 | 4 = 0.85 6" = 1.47 | | |
| | | | | | | | | 1 | 1 | |
| Time | Minutes | Rate | DTW | Gallons | рН | Specific | Temp. | Turbidity | REMARKS | |
| | Elapsed | (gpm) | (ft) | Purged | | Conductance | | (NTU) | (PID readings, color, | |
| | 1.0 | (mL/min) | | 12. | 2 2 1 | | | (10.7) | 0001, 000.) | |
| 1130 | 10 | 1:36 | 15.03 | 13.10 | +.71 | 4.48 | 12.08 | 70.7 | petroleum-like | |
| 1135 | 15 | 1.34 | 15.03 | 20,40 | 7.60 | 4.01 | 12.22 | 14,9 | odor extraleum lite | |
| 1148 | 20 | 1.36 | 15.03 | 27,20 | 7.64 | 4.01 | 12.67 | 4.02 | odor | |
| More Th | on 10 | wed | volum | es remove | d, tur | pidity le | ss Tha | 50 | NTU | |
| FINAL PTB: | 27.60 | F.+ BTOK | | | | 0 | | | | |
| Final PTW: | 14.54 | SH DOC | | | | | | | | |
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N

| Boring/Well | 1795-15- | 66 | Project/No | GPHPRI | NH. RUSC. HIPPIS | | Page | of |
|-----------------------------------|--------------------|------------------|-----------------|--|------------------------|-------------|---|--|
| Site | Fairl Da | MI CO. | | | | Drilling | Drilling | |
| Location | FORT | 1111 111 | | | | Started III | Completed 11/16/ | 15 |
| Total Depth D | Drilled | 26 | Feet | Hole Diamete | r10 | inches | Type of Sample/ Coring Device <u>2[™] ≲</u> | 5×2 |
| Length and D of Coring Dev | liameter /ice | | | | | | Sampling Interval | 20-26 feet |
| Land-Surface | Elev. | | feet | | Surveyed | Estimated | Datum | |
| Drilling Fluid | Used | Potable | Water | | | | Drilling Method | 6"4" HEA |
| Drilling Contractor | Nothno | de | | | | | Driller | Kyle Ryan |
| Prepared By | Meghos |) 1 Kise | 5 | | | | Hammer Hammer Weight 140 Drop | ins. |
| Sample/Core D (feet below land | epth I surface) | Core Recovery | PID Reading | Time/Hydraulic Pressure or Blows per 6 | | | | |
| From | То | (feet) | (ppm) | Inches | Sample/Core Descrip | otion | | |
| 0.0 | 5.0 | AM | ИИ | NA | band cleared | 0.0 -10 | 5.0 F-1 | |
| B P | | | | | | | | |
| LR | | | | | | | | |
| TI | | | | | | | | |
| NL | _ | L | | | | | STATE AND | איר בידע ביישע איז |
| PL | | | | | | | | |
| 20.0 | 22.0 | 1.6 | 1.1 2010 | 3-4-7-26 | arou fine to | midium | n sand, wet | |
| | | | 0.9 20,5 | | Estimate ada | w) | | |
| 103 | | | 1.821.0 | | dia dia | | | |
| | | | 6721.5 | | | | | |
| 22 0 | 24 N | 1.6 | 13220 | 12-22 07-61 | are Sino say | ford but | | |
| | | | his e | 1 2 17 31 | Estept do |) | | |
| | | | 67 23.0 | | <u>a sorge of 6000</u> | J | | |
| | | | 6 4 23 C | | | | | |
| 24 0 | 21 0 | 1.7 | A X 2015 | 26 211 11 15 | and hearing of | Leand. | | |
| 27.0 | 2010 | | 0.0 24.0 6 @ | 23-29-95-50 | Grag-Drown - | we surio, 1 | NON, MENSE | |
| | | | 0,029.5 @ | | CIVO 6000 | | | |
| | | | 0.025.0 Q | | | | | |
| | | | 0.025.5 | | | | | |
| EOB @ | 26.0 FT | Bas | | | Screened @ 2 | 4.6 TB | 26.0 FT BGS | |



| SAND (| Tit LAND SURFACE 3 12 Inches | Project <u>1795 AS Wells</u> Well <u>1795 AS - 07</u> Town/City <u>Watertown (Fort prum)</u> |
|------------------------------|---|---|
| O-S' C DAS | inch diameter | County <u>Jefferson</u> State <u>NY</u> |
| | drilled hole | Land-Surface Elevation and Datum: |
| | Well casing. | feet Surveyed |
| | 2 inch diameter, | Installation Date(s) |
| | Backfill | Drilling Method |
| | Grout <u>5-21 F4</u> | Drilling Contractor Nothnagle Prilling |
| | ft* | |
| | Bentonite Slurry | Development Technique(s) and Date(s) |
| 556 | ft*pellets | Air lifting 11/12/15 |
| | 12 cholor sand | |
| | | Fluid Loss During Drillinggallons |
| | _ <u>24_</u> ft* | Water Removed During Development ~ <u>Lle.0</u> gallons |
| | -Well Screen. | Pumping Depth to Water 15.13 feet below M.P. |
| | <u>S(1) 40 PVC</u> , <u>10</u> slot | Pumping Duration hours Minutes |
| | | Yield gpm Date Specific Capacity gpm/ft |
| | Gravel Pack | Well Purpose <u>Ait sparge</u> |
| | Formation Collapse | · Ø |
| | _ | Remarks Final PTB: |
| | <u>_2\ft*</u> | - |
| | J '' Measuring Point is | |
| | Top of Well Casing Unless Otherwise Noted. | MP Was WITH ~12 Inches of All above grade |
| Drilling Form Well Constr | Depth Delow Land Surface | |

| MONITON | ig we | | lopinei | n Log | | | | Page | l of | |
|--|---------|--|--------------------|----------------------|-----------|-----------------|---------|-----------------------|-----------------------|--------|
| Project/No. | Fort Dr | um In | P 1795 | AS WOUS | Well | 795-20-07 | Date | 11/12/ | 15 | |
| Total Depth | 27.00 | Ft MK | Casing Diameter | (inches) | 2 " | | Purge I | Method Centrifuga | al | |
| Water Level | 14.43 | H MIL | Well Volur | me (gal) | 2.010 | allons | | Submersi | ble | |
| Water Colum | n 12.57 | 57 | Total Volu | me Purged | ~ 26.0 | gallons | < | Other | air lifting | |
| Pump On 1040 Pump Off 166 Developed By Kevin Resch (Nethroge) | | | | | | | | | | hrod) |
| Well Casing Volumes Ø 4 1/1 = 0.00 01 = 0.46 21 = 0.27 41 = 0.65 | | | | | | | | | | |
| gallon/foot | | $1 - \frac{1}{2} = 0.06$ $1 - \frac{1}{2} = 0.09$ |)) | 2" = 0.1 2-½" = (| o).26 | 3 = 0 3-½" = | 0.50 | 4 = 0.85 6" = 1.47 | | |
| Time | Minutes | Rate | DTW | Gallons | pН | Specific | Temp. | Turbidity | REMARKS | |
| | Elapsed | (gpm) | (ft) | Purged | | Conductance | Ō | (NTU) | (PID readings, color, | |
| | | (mL/min) | | | | (mS/cm) | (F) | | odor, etc.) | |
| 1045 | 5 | 1.02 | 15.13 | 5.1 | 7.38 | 2.74 | 12.78 | 11.88 | | |
| 1050 | 16 | 1.02 | 15.13 | 10.2 | 7.43 | 2.68 | 12.76 | 9.87 | izer | |
| 10 55 | 15 | 1.02 | 15.13 | 15.3 | 7.48 | 2.64 | 12.73 | 6.98 | 1 | |
| 1100 | 20 | 1.02 | 15.12 | 20.4 | 7.51 | 2.58 | 12.71 | 4.90 | - | |
| 1105 | 25 | 1.02 | 15.12 | 25.5 | 7.52 | 2.56 | 12.66 | 4.68 | - | |
| Hore th | an lo | well | volume | removed | turbi | lity less. | than | SONT | 5 | |
| Final DTB | 27.60 | ADOC | | | | 0 | | | | |
| Final PTW | 14.47 | A BOOL | | | | | | | | |
| u. | | | | | | | | | | |
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Well Development Log.xls MW Development

5.8°



| Boring/Well | 1795-AS | -07 | Project/No. | GP 14 DRW | H. RUSC. HIPO | 15 | Page | of |
|----------------------------------|---------------------|------------------|----------------|--|----------------------|-------------|--------------------------------------|-------------|
| Site | _ | | / | | | Drilling | Drilling | 2 12 |
| Location | Fort D | rum, | NY | 2007A | | Started III | 64/15 Completed 11/10 | 1/15 |
| Total Depth [| Drilled | 26 | Feet | Hole Diameter | 10 | inches | Type of Sample/ Coring Device | 55×21 |
| Length and D | liameter vice | | | | | | Sampling Interval | 20-21- feet |
| Land-Surface | Elev. | | feet | | Surveyed | Estimated | Datum | |
| Drilling Fluid | Used _ | Potable | Wate | r | | | Drilling Method | 614" HSA |
| Drilling Contractor | Nathon | ale. | | | | | Driller Kevin Helper | Kyle Ryan |
| Prepared | Machao | Xiver | | | | | Hammer Hammer Weight | 30 ins. |
| Dy | - TRANOT | 1 1120 | | | | | | |
| Sample/Core E (feet below lan | Depth d surface) | Core Recovery | PID Reading | Time/Hydraulic Pressure or Blows per 6 | | | | |
| From | То | (feet) | (ppm) | Inches | Sample/Core Descript | ion | | |
| 0.0 | 5.0 | NA | NA | NA | hand chared | 0.0 to | 5.0 \$4 | |
| BP | | | _ | | | | and the state of the second | |
| ILR. | | | | | | 0.000 | Harrison Constitution and December 1 | |
| II | | | | | | | | |
| NL | — | | | | | | | |
| PL | | | | | | | | |
| 20.0 | 22.0 | 1.4 | 0.620.0 | 21-36-52-64 | gray. Sine san | to Net | dense. | |
| | | | 0.320.5 | | (slight odor | .) | | |
| | | | 0.3 21.0 | | 8 | | | |
| | | | NH215 | | No recovery, 1 | JG IIP | reacting | |
| 220 | 24 D | 1.1 | 0.620 | 15-54-58-NH | SAA | | ð | |
| | | | 6.3 22.5 | | (no odar) | | | |
| | | | 6.2 2 | | | | | |
| | | | NIN @ | | NO RECOVERY | DO DED | reading | |
| 24 0 | 21.0 |) 2 | N 23.5 | 11-12-61.04 | C N N | | June 9 | |
| 29.0 | 20.0 | 1.2 | 0.0 24.0 | 101-22-24-101 | (DA adar) | | | |
| | | | 0.024.5 | | | | | |
| | + | | 0.025.6 | | NIA FRANK PR | NG PTO | trading | |
| | - | | NM 43.5 | | U' | NO LTA | J | |
| TEOBE | 24 000 | PLAS | | - | SCREENER @ | 24.0 - | TO 26.0 FT BUS | |

7



| | Tit V LAND SURFACE 3 IL WORKS Arilled hole inch diameter | Project IP9S AS Wells Well IP9S-As - 08 Town/City Wocker-town (Fort prum) Output County Jefferson State NY Permit No. Land-Surface Elevation and Datum: |
|-------------|---|---|
| | Well casing, 2 inch diameter, SCH 40 PVC Backfill Grout $5-21$ F4 | feet Surveyed Estimated |
| | Bentonite slurry <u>23</u> ft* pellets A choter Sand | Development Technique(s) and Date(s) Air Lifting IV/12/15 Fluid Loss During Drilling gallons |
| | 24 ft* Well Screen. 2 Slot inch diameter Sand Pack Sand Pack | Water Removed During Development ¹ 30-70 gallons Static Depth to Water ¹ 4.70 Static Apple to Water ¹ 4.70 Pumping Depth to Water ¹ 5.99 Pumping Duration ² 25 Yield ¹ 9mming Duration Specific Capacity ¹ 9mming Duration |
| Drilling Fo | Formation Collapse Formation Collapse tt* ft* Measuring Point is Top of Well Casing Unless Otherwise Noted. * Depth Below Land Surface | Remarks <u>Final DTB: 27.00 Ft DTDC</u> <u>MP was with ~12 inches of PUC above grade</u> Prepared by <u>Meghon Kiser</u> |
| | Drilling For Well Cons | Image: Second |

| | .9 | | | | | | | Page | of |
|---|----------|--|------------|-----------------------|-----------|-------------------|------------|------------------------|-----------------------|
| Project/No. | Fort Dr | un I | LP Pg | s to wa | Well | 1795-AS-08 | Date | 11/12/1 | \$ |
| | | | Casing | | | | Purge N | /lethod | |
| Total Depth | 27.00 | PT BTOL | Diameter | (inches) | 2" | | | Centrifug | al |
| Water Level | 14.70 | FT BADC | Well Volu | me (gal) | 1.97 | gailons | | Submersi | ble |
| Water Colum | in 12.3 | 470 | Total Volu | ime Purged | ~ 30.71 | <u>s</u> gallons | (| Other | airUEling |
| Pump On | 0955 |) | | Pump Off | 0501 | | Develo | oed By | Kevin Rusch (Nothney) |
| usynytymenyn i chyrcholu diaddanau ferfanod | | Well Casin | g Volumes | | | | | | (ARIADIS) |
| gallon/foot | | $1 - \frac{1}{4}" = 0.06$ $1 - \frac{1}{4}" = 0.09$ | | 2" = 0.16 2-½" = 0 | 6 1.26 | 3" = 0. 3-½" = | 37 0.50 | 4" = 0.65 6" = 1.47 | 0 7 7 7 9 |
| | | 172 0.00 | | | | | | | |
| Time | Minutes | Rate | DTW | Gallons | pН | Specific | Temp. | Turbidity | REMARKS |
| | Elapsed | (gpm) | (ft) | Purged | | Conductance | \bigcirc | (NTU) | (PID readings, color, |
| | | (mL/min) | | | | (mS/cm) | (F) | | odor, etc.) |
| 1000 | 5 | 1.87 | 15.94 | 8.35 | 7.64 | 3.71 | 12.68 | 9.93 | 10 10 00011 . (11 000 |
| 1016 | 15 | 1.21 | 16.05 | 20.40 | 7.10 | 3.83 | 12.27 | 7.35 | petroleum. likade |
| 1015 | 20 | 1.24 | 16.05 | 26.60 | 7.70 | 3.77 | 12.38 | 6.40 | petroleum Likedur |
| 1020 | 25 | 0.82 | 16.05 | 30.70 | 7.65 | 3.78 | 12.36 | 5.98 | petrolaun-like adar |
| More the | n 10 | well | voluma | remove | d tur | bidity 4 | ss-that | 50 | NTUS |
| Final OTB: | 27.00 | PT BTOC | - | | | 0 | | | |
| Einal Dilu: | W.73 | PT BR | | | | | | | |
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| Boring/Well | 1795-A | 5-68 | Project/No | . GPH PR | KUM, RCSC. HI | 795 | Page | of |
|------------------------|------------------|------------------|------------------|----------------------------|----------------------|---|----------------------------------|--|
| Site | ÷ | | | | | Drilling | Drilling | |
| Location | fort | Prum, | NY | | | Started II | 109/15 Completed 11/69 | /15 |
| Total Depth [| Drilled | 26 | Feet | Hole Diamete | r lõ | inches | Type of Sample/ Coring Device | 55×21 |
| Length and D |)iameter vice | | | | | | Sampling Interval | 20-26 feet |
| Land-Surface | e Elev. | | feet | | Surveyed | Estimated | Datum | |
| Drilling Fluid | Used | Potub | le Wa | ter | | | Drilling Method | 6"4" HSA |
| Drilling Contractor | Notha | ade | | | | | Driller Busch Helper | Kuk Evan |
| Prepared | | 0 | | | | | Hammer Hammer | |
| Ву | Hegha | th Kiser | • | | | | Weight 140 Drop | <u>30</u> ins. |
| Sample/Core D | epth | | | Time/Hydraulic | | | | |
| (feet below land | surface) | Core Recovery | PID Reading | Pressure or Blows per 6 | | | | |
| From | То | (feet) | (ppm) | Inches | Sample/Core Descript | ion | | |
| 0:0 | 5.6 | NĄ | NH | NA | hand cleared | 0.0 tr | S.D. FT | |
| BP | | | | | | | | |
| LR | | | | _ | | | | |
| II | | | | | | | | |
| NL | | | | | | | | |
| PL | | | _ | | | | | |
| 20.0 | 22.0 | 2.0 | 0.0 20.0 | 3-7-21-59 | gray. fine sar | nd, wet | , dense | |
| | | | 6.0 20,5 | | (robo this) | | | |
| | | | 6.621.0 | | 0 | | _ | |
| | | | 0.821.5 | | | | | |
| 220 | 24.0 | 1.10 | 0.1220 | 19-31-51-50 | Grain- browin Si | has sond | Wet. donse | den bereiten er en |
| | | | ê.D.a.c | | (DO GOLON) | <u>, , , , , , , , , , , , , , , , , , , </u> | , or nerve | |
| | | | 0.0 20 | | CHO OCOP J | | | |
| | | | 0.0 23,0 | | | | | |
| 201 0 | 71 6 | 1 2 | 0.0 23.5 | 12 60.60 10 | 5 2 2 | -18 | | |
| 29.0 | 46.0 | <u>در، ۱</u> | @ @ | 12-30-30-M | JAA | | | |
| <u> </u> | | | 0.024.5 0.0 @ | | | | | |
| | | | @ | | | | | |
| . <u> </u> | | | NH 25.5 | | NO LECOVERY, NO | PIP R | FAD TRIP | |
| 1 | | | | | | | | |
| EOBC | 24.0 FT | BUS | | 1 | SCREENED @ | 24.0 T | 0 26.0 FT Bas | |

--Drilling Forms.xlsx.xls Boring Log

Well Construction Log

| SAND STAND SURFACE & IL INDAS PACK S BIAS A STAND SURFACE INCASS A STAND SU | Project IF9S AS Wells Well IF9S-AS-69 Town/City Water-town (Fort- prum) County Jessenson State NY Permit No. |
|--|---|
| Well casing, 2 inch diameter, SCH 40 PVC | Land-Surface Elevation and Datum: feet Surveyed Estimated Installation Date(s) Drilling Method |
| Backfill Grout <u>5 - 21 F</u> <u>21</u> ft* | Drilling Contractor Nothnagle Prilling Drilling Fluid Potable Water |
| Bentonite slurry <u>23</u> ft* pellets 18 chokey | Development Technique(s) and Date(s) |
| f* | Fluid Loss During Drillinggallons Water Removed During Development ~19.55gallons |
| Well Screen. <u>2</u> inch diameter <u>S(N 40 PVC</u> , <u>10</u> slot | Static Depth to Water 17.41 feet below M.P. Static Depth to Water 26.93 Feet below M.P. Pumping Depth to Water 19.12 feet below M.P. Pumping Duration 20 hourse feet below M.P. Yield gpm Date |
| Gravel Pack | Specific Capacity gpm/ft Well Purpose |
| 26 ft* | Remarks Final DTB: 27.00 FH BTOC |
| Measuring Point is Top of Well Casing Unless Otherwise Noted. * Depth Below Land Surface Drilling Forms.xlsx.xls Well Constr | MP was with ~ 12 inches of PVC above grade Prepared by Meghan Kiser |

| | • | | | | | | | Page | of |
|--|--|---------------------------|--|-----------|-----------|--|------------|------------------------|-----------------------|
| Project/No. | Fort D | run Iri | Pas | t was | Well | 1795-15-09 | Date | 11/12/1 | \$ |
| . , | unden Metjonen den en den | | Casing | | | | Purge I | Vethod | |
| Total Depth | 26.98 | FA BLOC | ,Diameter | (inches) | | Altroyologia da gana ha ana ha ana da da gana ha ana ana ana ana ana ana ana ana a | | Centrifug | al |
| Water Level | Water Level 17.41 Strong Well Volume (gal) 1.53 gallor | | | | | | | Submers | ible |
| Water Column 9.57 FL Total Volume Purged ~ 19.55 gallons | | | | | | | (| Other | airlifting |
| Pump On | 6920 | | | Pump Off | 6946 | | Develo | ped By | Kevin Bush CNohnage |
| | | Well Casin | g Volumes | | | | | | FURTER NEED CALORDS |
| gallon/foot | | $1 - \frac{1}{4}" = 0.06$ | | 2'' = 0.1 | 6 1 26 | 3" = 0. 3-1⁄2" = | 37 0.50 | 4" = 0.65 6" = 1.47 | |
| | | 1-72 - 0.03 | , | 2-72 - 0 | | 072 | | | |
| Time | Minutes | Rate | DTW | Gallons | рН | Specific | Temp. | Turbidity | REMARKS |
| | Elapsed | (gpm) | (ft) | Purged | | Conductance | \bigcirc | (NTU) | (PID readings, color, |
| | | (mL/min) | | A | | (mS/cm) | (F) | | odor, etc.) |
| 0925 | 5 | 1.53 | 18.12 | 7.65 | 7.54 | 1.74 | 11.94 | 30.3 | |
| 0930 | 16 | 1.62 | 17.91 | 12.75 | 7.62 | 1.68 | 12.63 | 18.9 | ~ |
| 69 35 | 15 | 6.85 | H.87 | 15.30 | 7.66 | 1.59 | 12.63 | 12.4 | 8 |
| 6940 | 20 | 5.85 | P.78 | 19.55 | 7.15 | 1.28 | 12.4) | 12.18 | |
| Mare Jaco | 10 . | 101 10 | INK TI | moved to | urbitih. | Uss than | SO N | TY | |
| fund here | 12 00 | | -1103 10 | | (|) | | | |
| PITAL VID. | 10 111 | AT MOC | | | | | | | |
| KILLON NIM | 14.91 | + NIOC | | | | | | | |
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| Boring/Well | 1-795-AS | - 69 | Project/No | . GRIMPRU | IM. RUSC. HT | 795 | Page of |
|------------------------|-----------|----------|-----------------|----------------|-----------------|--------------|--|
| Site | | | | | | Drilling | Drilling |
| Location | For-1 Dr | UM, NY | | | | Started | 165/15 Completed 11/05/15 |
| Total Depth [| Drilled | 26 | Feet | Hole Diamete | r | inches | Type of Sample/ Coring Device 2 ¹¹ × (c × 2 ¹ |
| Length and D | Diameter | | | | | | |
| of Coring Dev | vice | | | | | | Sampling Interval 20-24 feet |
| Land-Surface | e Elev. | | feet | | Surveyed | Estimated | Datum |
| Drilling Fluid | Used | Potabl | e Nate | ٢ | | | Drilling Method |
| Drilling Contractor | No | hade | | | | _ | Driller Kevin Helper Kyle Jugan |
| Prepared Bv | 11 | bank | · · | | | | Hammer Hammer |
| -, | | | rser | | | | |
| Sample/Core D | epth | Core | PID | Time/Hydraulic | | | |
| (reer below land | a sundocy | Recovery | Reading | Blows per 6 | | | |
| From | То | (feet) | (ppm) | Inches | Sample/Core Des | scription | |
| 0.0 | 5.0 | NA | NH | NA | hand cloaved | 0.0 70 | S.O PT BUS |
| BP | | | | | | | |
| LR | | | | | | | |
| TT | | | | | | | |
| NL | | | | | | | |
| PL | | | | | | | |
| 20.0 | 22.0 | 1.7 | 0.0 <u>20.6</u> | 19-34-48-40 | gray - brow | n. fire to p | rains sand, wet |
| | | | 0.0 20.5 | - | (no odos) | , | |
| | | | 0.021.0 | | | | |
| | | | 0.0 21.5 | | | | |
| 22.0 | 24.0 | 1.1 | 0.0 22.0 | 17-34-48-10 | SAA | | |
| | | | 0.0 22.5 | | | | |
| | | | C NH 23.0 | | | | |
| | | | @ NH 23.5 | | | | |
| 24.6 | 26.0 | 1.2 | @ 0.024.0 | 19-48-50-17 | 442 | | |
| | | | 0.0 24.5 | | | | |
| | | _ | NH 25.6 | | | | |
| | | | NM 25.5 | | | | |
| | | | | | | | |
| EOBE | 26.0 FT | Bens | | | SCLEEN @ | 24.0 FT TO | 26.0 FT 1305 |

Well Construction Log

| A IND SURFACE & 12 Inch | Project <u>1795 AS Wells</u> Well <u>1795 AS - 10</u> Town/City Water town (Fart Drum) |
|--|--|
| INAL CONTRACTOR | County <u>Jefferson</u> State <u>NY</u> |
| BINS drilled hole | Land-Surface Elevation and Datum: |
| Well casing, | feet Surveyed |
| <u>SCH 40 PVC</u> | Installation Date(s) 11/65/15 Drilling Method 61/9 |
| Grout <u>5 ~ 26</u> | St Drilling Contractor Nothnagle Prilling |
| 2 4 ft* | Drilling Fluid Potable Woter |
| Bentonite | Development Technique(s) and Date(s) |
| <u>28</u> ft* □pellets Bacho | ker |
| sar | General Sector Fluid Loss During Drilling |
| ft* | Water Removed During Development ~ 33.00 gallons |
| Well Screen. | Static Depth to Water19.56 FAfeet below M.P.Static Depth to Water32.00 FAFeed below M.P.Pumping Depth to Water20.13feet below M.P. |
| 2 inch diam <u>S(1) 40 PVC</u> , <u>10</u> slo | eter ot Pumping Duration <u>21 hours</u> Minutes |
| | Yieldgpm Date |
| Gravel Pack | Well Purpose <u>Ail starge</u> |
| Formation Collapse | |
| 2) #* | Remarks FINAL DTB: 32.00 FH BTDL |
| ft* | |
| Measuring Point is Top of Well Casing Unless Otherwise Noted. | MP was with ~ 12 inches of pvc above grade |
| * Depth Below Land Surface Drilling Forms.xlsx.xls Well Constr | Prepared by Meghon Kiser |

| Monton | ig vve | | iopinici | it Log | | | | Page | of |
|-------------|---------|--------------------|------------|----------------------|-----------|------------------|-------------|-----------------------|--|
| Project/No. | Ford Dr | um IRP | PAS AS 1 | Nals | Well | MS-AS-10 | Date | 11/12/15 | |
| | IV. N | | Casing | | | | Purge l | Method | 1.0 |
| Total Depth | 32.00 | FI BTOC | Diameter | (inches) | 2" | | | Centrifug | al |
| Water Level | 19.56 F | 4 BTOC | Well Volu | me (gal) | 1.99 | gallons | | Submersi | ble |
| Water Colum | in 12.4 | 1 54 | Total Volu | ime Purged | ~ 33.00 | gailons | | Other | air lifting |
| Pump On | 6840 | | | Pump Off | 0901 | | Develo | ped By | Kevin Jusch (Northno Manhan Kazr (Agraps) |
| | | Well Casin | g Volumes | | | | 07 | | 0 |
| gallon/foot | | 1-1/4" = 0.06 | 5) | 2" = 0.1 2-½" = (| 6).26 | 3" = 0 3-½" = | .37 0.50 | 4 = 0.65 6" = 1.47 | |
| | | T | | | I | | | | |
| Time | Minutes | Rate | DTW | Gallons | рН | Specific | Temp. | | REMARKS |
| | Elapsed | (gpm) (ml (min) | (π) | Purgea | | (mS/cm) | (E) | (110) | (PID readings, color, odor, etc.) |
| RACI | 16 | 129 | 20.13 | 17.85 | 202 | 2.38 | 11.19 | 9.53 | |
| 6855 | 15 | 162 | 20 14 | 25.50 | 7.54 | 2.34 | 11.56 | 1.15 | - |
| 69.00 | 20 | 1.55 | 20.14 | 32.30 | 7.59 | 2.39 | 11.39 | 626 | - |
| Mara al | 18 | 1.30 | 20.11 | ranged | turbed | Hy locat | | ATTU | |
| FIOTE-THA | 10 | Wed V | BUCHNO - | 161104-0 | | | tan so | | |
| FINAL DID. | 32.00 | FILLIOC | 9 | | | | | | |
| Final DIN: | 18.56 | FT BIBC | | | | | | | |
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| Boring/Well | 1795- | AS-10 | Project/N | O. GPHDRY | UM, RUSC. HIF | 195 | Page of Z |
|------------------------|------------|--------|--------------------|----------------------------|----------------------|------------|---|
| Site | | | | | | Drilling | Drilling |
| Location | Fort | pram, | NY | | | Started j) | 105/15 Completed 11/05/15 |
| Total Depth I | Drilled | _31 | Feet | Hole Diamete | er <u>10</u> | inches | Type of Sample/ Coring Device $2^{11} \times 55 \times 2^{11}$ |
| Length and E | Diameter | | | | | | |
| of Coring De | vice | | | | | | Sampling Intervalfeet |
| Land-Surface | e Elev. | - | feet | | Surveyed | Estimated | Datum |
| Drilling Fluid | Used | Poto | ble w | ater | | | Drilling Method |
| Drilling Contractor | Noth | nade | | | | | Driller Kyle Kyan |
| Prepared | | 0 | | | | | Hammer Hammer |
| Ву | Megh | ian K | ISEF | | | | Weight 140 Drop 30 ins. |
| Sample/Core D | Pepth | | | Time/Hydraulic | | | |
| (feet below land | d surface) | Core | PID | Pressure or Blows per 6 | | | |
| From | То | (feet) | (ppm) | Inches | Sample/Core Descript | tion | |
| 0.0 | 5.0 | NA | NM | NA | hand cleare | 0.0 - | TO S.O PT BAS |
| BP | _ | | | | | | |
| LR | | | | | | | |
| エエ | | | | | | | |
| NL | | | | | | | |
| DL | | | | | | | |
| 19.0 | 21.0 | 114 | N.D 19.0 | 8-11-11-26 | arcos - brown | fin sund | wat |
| | | | 0.0 19.5 | 0 10 10 20 | gray proven | THE JUNU | |
| | | | 6020.0 | | (No duor) | | |
| | | | A.S. 20.5 | | | | |
| 21.0 | 23.0 | 1.1. | Q.0 210 | 3-15-10 20 | also brains | Fig to | |
| | | | 61215 | 2-10-14-24 | gray - prown, | Alle au | manun sam, wet, dense |
| | | | C. U.Z. | | (no odor) | | |
| | | | A 2 22 C | | | | |
| 23.0 | 25.0 | 12 | 6 1 22.6 | 2 14 27 (12 | · · · · · | | |
| | 2.5 | | @ 01225 | 5-17-64-1/ | Gray - Droing, TI | ne sona; | Net, dense |
| | | | 0.1 200 0.1 200 | | (05 000r) | | |
| | | | 111 24.0 | | | | |
| 1 | |) | INM CHIS | | | | |
| | Next pa | per l | | | | | |
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| Sampl | | DIS | ont d) | | | |
|--------------------------------|----------------------|--------|---------------|-------------------------------|----------------------------------|-------|
| Boring/Well | | | 5- AS-1 | 10 | Page 2 o | f |
| Prepared by | / | Megh | on Kier | | | |
| Sample/Core (feet below lar | Depth nd surface) | Core | PID | Time/Hydraulic Pressure or | | |
| From | То | (feet) | (ppm) | Inches | Sample/Core Description | |
| 25.6 | 27.0 | 1.5 | A.) 25.0 | 5-26-42.41 | Are Sin sand with home | |
| | | | e ol 2 | 12 JU H-J4 | O ,) | |
| | | | 0.1 25.5 | | (NG ODER) | |
| | | | 0.1 26.0 | | | |
| | | | 0.3 265 | | | |
| 27.0 | 29.0 | 2.0 | 0.6 0.0 | 21-48-50-52 | - SAL | |
| | | | 0.6 2 | | | 10.00 |
| | | | e e | | | |
| | | | 6.0 28.0 | | | |
| | | | 0.0 28.5 | | | |
| 29.0 | 31.0 | 1.8 | 0.6 29.0 | 21-37-42-70 | 544 | |
| | - | | 6 5 29 C | | | |
| 1 | | | 0.0 21.3 C | | | |
| | | | 0.0 30.0 | | | |
| | | | 0.0 30.5 | | | |
| | | | | _ | | |
| EOB @ | 31.0 24 | RAS | | | | - |
| | | 2003 | | | 12 LEEN @ 24.0 FT TO 31.0 FT BAS | |
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Well Construction Log

| SAND PACE 0-65' BINS | And SURFACE 3 12 Inches | Project Image: Project |
|-------------------------------|--|--|
| | Well casing, 2 inch diameter, SCH 40 PVC Backfill Grout 5 - 26 FH | Installation Date(s) Drilling Method Drilling Contractor Drilling Fluid Installation Date(s) Installation |
| | Bentonite slurry <u>28</u> ft* pellets Sond | Development Technique(s) and Date(s) Air USAing 11/12/15 Fluid Loss During Drilling |
| | <u>29</u> ft* Well Screen. <u>2</u> inch diameter <u>S(1) 40 PVC</u> , <u>10</u> slot □Gravel Pack | Water Removed During Development ~ 27.50 gallons Static Depth to Water 12.39 feet below M.P. Static Depth to Water 20.41 feet below M.P. Pumping Depth to Water 20.41 feet below M.P. Pumping Duration 21 bours minutes Yield gpm Date Specific Capacity gpm/ft Well Purpose Ait Starge |
| | Sand Pack Formation Collapse | Remarks <u>Final PTB: 32.00 ft BTOC</u> MP was with ~ 12 inches of PVC above grade |
| Drillin Well C | Unless Otherwise Noted. * Depth Below Land Surface g Forms.xlsx.xls onstr | Prepared by Mcahon Kiser |

| Project/No. <u>Fort Pum IRP 1745 & Neds</u> well 1795-A5-11 Date <u>11/12.1/5</u> Casing <u>Casing</u> Casing <u>2 11</u> Date <u>11/12.1/5</u> Total Depth <u>32.0 PT NU</u> Diameter (inches) <u>2 11</u> Date <u>11/12.1/5</u> Purge Method Centrifugal Water cloum <u>13.0 St</u> Total Volume Purged <u>27.05 gatters</u> Pump On <u>081b</u> Pump Off <u>6831</u> Developed By <u>Levin Roch (Methods)</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>5' = 0.37</u> <u>4' = 0.85</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>5' = 0.37</u> <u>4' = 0.85</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>5' = 0.37</u> <u>4' = 0.85</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>5' = 0.37</u> <u>4' = 0.85</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>5' = 0.87</u> <u>4' = 0.85</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>5' = 0.87</u> <u>4' = 0.85</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>1.47</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>5' = 0.87</u> <u>4' = 0.85</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>1.47</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>5' = 0.37</u> <u>4' = 0.85</u> <u>1.47 = 0.06</u> <u>2' = 0.16</u> <u>1.47</u> <u>1.47 = 0.06</u> <u>1.47</u> <u>1.47 = 0.06</u> <u>1.47</u> <u>1.47 = 0.06</u> <u>1.47</u> <u>1.47 = 0.06</u> <u>1.47</u> <u>1.47 = 0.45</u> <u>1.47 = 0.45</u> <u>1.47 = 0.45</u> <u>1.47 = 0.45</u> <u>1.47 = 0.45 <u>1.47 = 0.45</u> <u>1.47 = 0.45 <u>1.47 = 0.45 = 0.45</u> <u>1.47 = 0.45 <u>1.47 = 0.45 <u>1.47 = 0.45</u></u></u></u></u> | MONITORI | iy vvei | Deve | lopinei | it LOg | | | | Page | of |
|---|-------------|---------|---|--------------------|-----------------------|-----------|------------------------|-------------|------------------------|---|
| Total Depth 32.0 F1 ML Casing Diameter (inches) 2 11 Purge Method Centrifugal Water Level 13.6 17 ML Total Volume (gal) 2.10 0.000 | Project/No. | Fort D | um IR | P 1795 | K Wells | Well | 195-A5-11 | Date | 11/12/ | 5 |
| Water Level 13.81 FT FNW Well Volume (gal) 2.10 gallers Submersible | Total Depth | 32.0 | FT MOL | Casing Diameter | (inches) | 2 " | | Purge I | Vethod Centrifug | al |
| Water Column 13.11 SA Pump On 0110 Other 1000 memory of 10000 memory of 1000 memory of 1000 memory of | Water Level | 18.89 | FT BTOC | Well Volu | me (gal) | 2.10 | allow | | Submersi | ble |
| Pump On Off Ogene Off Ogene Opened By Lown Buch Little and State gallon/foot 1-%" = 0.06 2" = 0.16 3" = 0.37 4" = 0.85 3-%" = 0.50 0" = 1.47 Time Minutes Rate DTW Gallons pH Specific Temp. Turbidity REMARKS Time Minutes Rate DTW Gallons pH Specific Temp. Turbidity REMARKS 6815 5 1.53 20.91 7.45 7.52 3. (1/2) J1.60 14.2 — 0820 16 1 53 20.31 15.30 7.53 3. 13 J1.60 14.2 — 0830 20 1.02 20.25 27.20 7.43 3.15 J1.64 18.1 Phroteanse Material Final M1 32.05 A max | Water Colum | n 13.11 | F | Total Volu | ime Purged | ~ 27.5 | 8 gaulons | (| Other | air lifting |
| Well Casing Volumes 7 0 gailon/foot 1-Xr = 0.08 2' = 0.16 3'' = 0.37 4'' = 0.65 6'' = 1.47 Time Minutes Rate DTW Gailons pH Specific Temp. Turbidity REMARKS (in, Ummin) (in) Purged P Specific Temp. Turbidity REMARKS (in, Ummin) (in) Queged P Specific Temp. Turbidity REMARKS (in, Ummin) (in) Queged P Specific Temp. Turbidity REMARKS (6515 5 1.53 2.0.91 7.52 3.1V II.62 40.2 | Pump On | 0810 | 1900 y 1991 y 1992 y 1993 y 1997 y | о Б | Pump Off | 6831 | | Develo | ped By | Kevin Busch (Nothhoge) Heghen Kurr (ARCA Fils) |
| Time Minutes Rate Elapsed DTW (ft) Gallons Purged pH Specific Conductance (mS/cm) Turbidity (ft) REMARKS (PID readings, color, oddr, etc.) 681/5 5 1.5.3 20.41 7.45 7.52 3.14 11.62 40.2 | gallon/foot | | Well Casin 1-¼" = 0.06 1-½" = 0.09 | g Volumes | 2" = 0.16 2-½" = 0 | 5).26 | 3" = 0. 3-½" = | .37 0.50 | 4" = 0.65 6" = 1.47 | 0 |
| Elapsed (ft) Purged Conductance (mS/cm) (ft) Purged (ft) (PID readings, color, color, etc.) 0815 5 1.53 20.41 7.52 $3.1b$ 11.62 40.2 $ 0825$ 16 1.53 20.31 15.30 7.53 3.13 11.60 19.2 $ 0825$ 15 $1.3V$ 20.24 22.10 7.57 3.13 11.62 19.9 Petrolaum-tive obstram-tive obstram-tive 0835 20 1.02 20.25 27.20 7.453 3.15 11.64 19.1 Petrolaum-tive obstram-tive 0835 20 1.02 20.25 27.20 7.453 3.15 11.64 19.1 Petrolaum-tive obstram-tive 0835 20 1.02 20.25 27.20 7.453 3.15 11.64 19.1 $Petrolaum-tive 1001000000000000000000000000000000000$ | Time | Minutes | Rate | DTW | Gallons | рН | Specific | Temp. | Turbidity | REMARKS |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | Elapsed | (mL/min) | (ft) | Purged | | Conductance (mS/cm) | (F) | (NTU) | (PID readings, color, odor, etc.) |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 6815 | 5 | 1.53 | 20.41 | 7.65 | 7.52 | 3.16 | 11.02 | 40.2 | 1 |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | 6826 | 16 | 153 | 20.31 | 15.30 | 7.53 | 3.13 | 11.60 | 19.2 | u |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | 0825 | 15 | 1.36 | 26.24 | 22.10 | 7.57 | 3.17 | 11.62 | 18.9 | petrolaum. lite |
| Hore than 10 way volume purged, turbicity loss than 50 NTU Final M1 32.00 Fi ma Final M1 32.00 Fi ma Final M1 32.00 Fi ma Image: Strate in the strategies of the strategi | 0830 | 20 | 1.02 | 20.25 | 27.20 | 7.63 | 3.15 | 11.64 | 18.1 | petro levern - 1. ile |
| Final MB 32.05 F1 mu 0 | Hore to an | 10 wa | volum | a mara | d. turbid | ity less | than so | NTU | | |
| Final DTM 18.99 24 broc | Final 1978 | 32.00 | fl ma | 0 | | ð | | | | |
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| Boring/Well | 1795-1 | AS-1) | Project/No | 0. GP14P | KUM, RUSL | H1795 | Page of 2 |
|-----------------------------------|--------------------|----------|---------------|-------------------------------|---------------|---------------|---|
| Site | | | | | | Drilling | Drilling |
| Location | Fort | prum, | NY | | | Started 11/ | 104/65 Completed 11/05/05 |
| Total Depth I | Drilled | 31 | Feet | Hole Diamete | er \0 | inches | Type of Sample/ Coring Device 2 ^{II} 55 × 2 |
| Length and D | Jiameter vice | | - | | | | Sampling Interval 10 2) foot |
| Land-Surface | e Elev. | | feet | | Surveved | Estimated | |
| Drilling Fluid | Used | Petab | - WA | tor f | | | Drilling Method bella di ben |
| Drilling Contractor | Nothe | ale | <u> </u> | 021 | | | Kevin Holog Kul R |
| Prepared | | J | | | | | Hammer Hammer |
| Ву | Megh | an Kis | cr | | | | Weight <u>140</u> Drop <u>30</u> ins. |
| Sample/Core D (feet below land | epth d surface) | Core | PID | Time/Hydraulic Pressure or | | | |
| From | Te | Recovery | Reading | Blows per 6 | | 3 8213/102 | |
| | | | (ppm) | | Sample/Core D | escription | |
| - n | 5.0 | NA | NM | NA | hand cle | eared 0.0 - | to 5.0 ft |
| | | + | | | | | |
| LK | | | | | | | |
| TI | | | | | | | |
| NL | | | ++ | | | | |
| D L | 23. | 1.4 | e | | | _ | |
| 19.0 | 21.0 | 1,4 | 213 19.6 C | 6-12-13-12 | gray-brow | n, fire sand, | wet, dense |
| | | | 3.7 19.5 C | | (slight od | Go | |
| | | | 4.7 20.0 @ | | | | |
| | | | NH 2015 | | no recover | y no PID r | reading |
| 21.0 | 23.0 | 2.0 | 0.3 21.0 @ | 4-11-13-17 | SAA | 0 | 0 |
| | | | 0.221.5 | | | | |
| | | | 0.4 22.0 | | | | |
| | | ļ | 0.2 22.5 | | | | |
| 23.0 | 25.0 | 1.2 | 0.7 23.0 | 5-5-12-15 | SAA | | |
| | | | 0.9 23.5 | | | | |
| | | | 0.8 24.0 | | | | |
| | | | NH 24.5 | | NO recovery | 1. No PID rea | prich |
| Lsee | next pa | ge) | | | C | y | 9 |
| | | 0 | | | | | |

| | Sample | ARCAD Core L | o is .og (Co | ont.d) | | |
|--------|------------------------------------|--------------------|------------------------|----------------|--|-----------------------------------|
| | Boring/Well | | 1795 | - AS-11 | | Pageof |
| | Prepared by | | Megh | an Ki | Set | |
| | Sample/Core Do (feet below land | epth I surface) | Core Recovery | PID Reading | Time/Hydraulic Pressure or Blows per 6 | |
| | From | То | (feet) | (ppm) | Inches | Sample/Core Description |
| | 25.0 | 27.0 | 1.6 | 0.025.0 | 3-9-18-28 | gray brown, fine sand, wet, dense |
| | | | | 6.6 25.5 | | Cho Edica |
| | | | | 0,624.6 | | |
| | | | | 0.0265 | | |
| | 27.0 | 29.6 | 1.4 | 0.022.6 | 14-27-1.4-50 | arous Sine sand wird donse |
| | | | - | e h D D | 110 910 01 02 | and the start well below |
| | | | | 0.0 4.5 | | |
| | | | | 0.0 Cl.0 | | |
| | 24 | | | A·M 28.5 | | no recovery, no PIP reading |
| (| 29.0 | 31.0 | 2.0 | 0.0 29.0 E | 25-35-413-61 | - SAA |
| (|) | | | 0.029.5 | | |
| | | | | 0.0 30.6 | | |
| | | | | 0.0 30.5 | | |
| | | | | | | |
| | EOBE | 31.0 \$7 | 865 | | | SCROLD @ 29.0 TO 31.0 FT BGS |
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Drilling Forms.xlsx.xls Boring Log

Well Construction Log

| sanp (| And SURFACE } 12 indes | Project 1795 AS Wells Well 1795-AS-12 Town/City Watertown (Fort Drum) |
|--------|---|--|
| 0-1051 | | County Jenerson State NY |
| BAS | inch diameter | Permit No. |
| | drilled hole | Land-Surface Elevation and Datum: |
| | | feet Surveyed |
| | | |
| | 2 inch diameter. | Installation Date(s) |
| | SCH 40 PVC | Drilling Mathed |
| | / Backfill | |
| | Grout 5-26 54 | Drilling Contractor Nothnagle Prilling |
| | | Drilling Fluid Patable Mater |
| | | |
| | | |
| | | Development Technique(s) and Date(s) |
| | | Air lifting 11/12/15 |
| | ft*pellets | 0 |
| | A choker sand | |
| | | Fluid Loss During Drillinggallons |
| | f* | Water Removed During Development ~ 26.9 gallons |
| | | Static Depth to Water: <u>20.36 S</u> + feet below M.P. Static Verth TS Betten: <u>32.0 S</u> + below M.P. Pumping Depth to Water <u>21.31</u> feet below M.P. |
| | inch diameter | Pumping Duration 27 hours minute |
| | | Vield opp Date |
| | | |
| | Gravel Pack | Specific Capacity gpm/π |
| | | Well Purpose <u>Air sparge</u> |
| | | |
| | Formation Collapse | |
| | | Remarks Final PTB: 32.00 ft FTOL |
| | <u>∃_31_</u> π* | |
| | π* | |
| | Measuring Point is | 110 is all to it of put |
| | Top of Well Casing Unless Otherwise Noted. | MY was with I'V ~ 12 Inches above grade |
| | * Depth Below Land Surface | Prepared by Meanon Kiser |
| | Drilling Forms.xlsx.xls Well Constr | 0 |

| Wonitori | ig vve | li Deve | lopmer | it Log | | | | Page | of |
|-------------|----------|--|--------------------|--|---------------------------------|-------------|--------|--|--|
| Project/No. | Fort | Prum I | LILP PAS | AS Wells | Well | 1795-AS-12 | Date | 11/12/1 | 5 |
| Total Depth | 32.0 A | BTOL | Casing Diameter | (inches) | 2 " | | Purget | vlethod Centrifug | al |
| Water Level | 20.36 5 | A BTOL | Well Volu | me (gal) | 1.86 0 | allons | (| Submers | ble |
| Water Colum | in 11. V | 474 | Total Volu | me Purged | -26.9 | aallon | | Other | airlifting |
| Pump On | 072 | 5 | • | Pump Off | 0752 | 0 | Develo | ped By | Keyin Burch (Norhnoc Hoghon Norr (ARIA PC |
| | | Well Casin | g Volumes | 01 0.44 | | 21 - 0 | 07 | 4" - 0 CE | 0 |
| gallon/foot | | $1 - \frac{1}{4}^{"} = 0.06$ $1 - \frac{1}{2}^{"} = 0.09$ |) | 2 = 0.10 |).26 | 3-1/2" = | 0.50 | 4 = 0.03 6" = 1.47 | |
| Time | Minutes | Rate | | Gallons | рНа | Specific | Temp. | Turbidity | REMARKS |
| Time | Elapsed | (apm)) | (ft) | Purged | pri | Conductance | (C) | (NTU) | |
| | mapped | (mL/min) | (, | | | (mS/cm) | (F) | | (PID readings, color, odor, etc.) |
| 0730 | 5 | 1.36 | 21.31 | 6.8 | 7.67 | 2.24 | 12.04 | 157 | |
| 0740 | 15 | 0.85 | 21.67 | 15.3 | 7.62 | 2.19 | 11.13 | 44.0 | petrolaum-like |
| 6745 | 28 | 1.19 | 21.67 | 2).25 | 7.61 | 2.16 | 11.45 | 20.2 | petroleum - like |
| 6750 | 25 | 1.02 | 21.67 | 26.35 | 7.62 | 2.13 | 11.29 | 16.1 | 6 |
| More than | 10 | was | volu no | removed | turbid | ity bsy the | n 50 | NTU | |
| Final DTR: | 32.00 | A MOL | | | | | | | |
| Final Prw | : 20.31 | FJ PML | | | | | | | |
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| Site Location Total Depth Di Length and Di of Coring Devi Land-Surface Drilling Fluid L Drilling Contractor Prepared | For-+ Dr rilled ameter ice Elev. | <u>-un</u> , 1 31 | Feet | Hole Diameter | 10. | Drilling Started MI | Drilling <u>04/15</u> Completed <u>1\164</u> Type of Sample/ | 1/1.5 |
|---|--|----------------------|-------------------------|--|------------------------|------------------------|--|--|
| Location Total Depth Dr Length and Di of Coring Devi Land-Surface Drilling Fluid L Drilling Contractor Prepared | For+ Dr rilled ameter ice Elev. | 31 | NY Feet | Hole Diameter | 10 | Started M | Type of Sample/ | <u>+//<</u> |
| Total Depth Di Length and Di of Coring Devi Land-Surface Drilling Fluid L Drilling Contractor Prepared | rilled _ ameter ice _ Elev | 31 | Feet | Hole Diameter | 10. | inches | Type of Sample/ | 21 |
| Length and Di of Coring Devi Land-Surface Drilling Fluid L Drilling Contractor Prepared | ameter ice Elev. Jsed | | | | | | Coning Device | SX2 |
| Land-Surface Drilling Fluid L Drilling Contractor Prepared | Elev. | | | | 8 | | Sampling Interval | 19 - 31 feet |
| Drilling Fluid U Drilling Contractor Prepared | Jsed | | feet | | Surveyed | Estimated | Datum | |
| Drilling Contractor Prepared | 2. | Potab | le WO | ter | | | Drilling Method | lelig" HSA |
| Prepared | Natha | o cho | | | | | Driller Busch Helper | Kyle kyan |
| Ву | Megho | n Kis | cr | - | | 2 | Hammer Hammer Weight <u>140</u> Drop | , |
| Sample/Core De (feet below land | epth surface) | Core Recovery | PID Reading (opm) | Time/Hydraulic Pressure or Blows per 6 Inches | Sample/Core Descriptic | on | | |
| Δ.Ν | ED | MA | KIM | NA | HAND CLEADED | A.A.TR | 5.0 FT | |
| p n | 5.4 | 1017 | //// | 10 | This cluber | 0.0 | | |
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| 19 0 | 21.0 | 1.7 | 0.0.90 | 2-14-15-21 | Aron -brown | Fin- sond | a wet donce | |
| 11.0 | 6110 | | 6 Die | 11115 61 | (De edez) | 71102 20110 | | |
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| 21.0 | 23.0 | 110 | N.0 21.0 | 5-16-15 61 | 200 | | | |
| | - | | 0.0 21.5 | | | | | |
| | | | 0.022.0 | | | | | |
| 0.0 | 24.0 | | 0.0 22.5 @ | 1 (2.17.22 | hromin | Nom Sin | 6 form 6000 | 2 b C o |
| 25.0 | 25:0 | 1.4 | 0.025.0 | 10-12-14-66 | gray - brown, | Very the | 2 sana, wer, a | |
| | | | 0.023.5 | | (Do octor) | | | |
| | | | 0.0 24.0 @ | | | 0 | P and inc | |
| | | * | NH 29.5 | | NO Kecovery | NO ATD | Jeauing | |
| 1 | next pag | (+) | | | | | | And a second |

| \sim | | ARCAD | IS | | | |
|-------------|---------------------------|--------|----------------|----------|----------------------------|----------------------------------|
| | Sample/Core Log (Cont.d) | | | | | |
| Boring/Well | | | 1795-AS-12 | | | Page 2 of 2 |
| Propared by | | | Mechan Kiser | | | |
| | Trepared by | | O | | | _ |
| | Sample/Core Depth | | Time/Hydraulic | | Time/Hydraulic | |
| | (feet below land surface) | | Core | PID | Pressure or Blows per 6 | |
| | From | То | (feet) | (ppm) | Inches | Sample/Core Description |
| | 25.6 | 27.0 | 113 | 0.0 25.0 | 4-11-17-24 | gray, very fine sand, Wet, dense |
| | | | | 0.025.5 | | (he odors) |
| | | | | 0.026.0 | | |
| | | | | NH 26.5 | | No recovery, no PID reading |
| | 27.0 | 29.0 | 1.7 | 0.0270 | 7-18-30-34 | SAA |
| | Cho | 211- | | 0.025 | | |
| | | 1 | | 0.028.0 | | |
| | | | | 6 0 28.5 | | |
| | 24 . | 21.0 | 1.2 | A1 29.5 | 10-21-21-20 | SAA. |
| 1 | 29.0 | 51.0 | 1:0 | A 729.6 | 10 01 51 50 | |
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| | - | | | 0:230:5 | | |
| | Fir O | | | | | (1700 @ 29.0 TO 31.0 FT BGS |
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